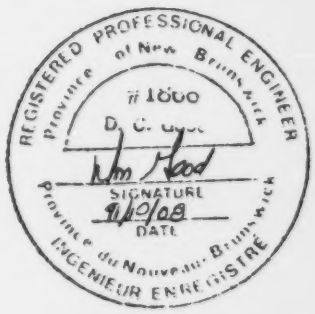
FINAL REPORT

FREDERICTON - MONCTON TCH CORRIDOR O-D TRAFFIC SURVEY ANALYSIS 1990 - 1991

Prepared For:

Department of Transportation
Planning Branch



September, 1991

FGA

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September 23, 1991

90-0527-34

Mr. George Thompson, P.Eng.
Planning Branch
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P.O. Box 6000
Fredericton, NB
E3B 5H1

RE: FREDERICTON - MONCTON TCH CORRIDOR O-D TRAFFIC SURVEY ANALYSIS 1990 - 1991 - FINAL REPORT

Dear George:

I have enclosed ten copies of the above final report. As indicated in the enclosed document almost 18,000 roadside interviews were conducted during the two survey periods. I am confident the results will be useful in on-going as well as future TCH corridor studies.

Yours truly,

Don Good

DON GOOD, P.ENG.
VICE-PRESIDENT

/rc

TABLE OF CONTENTS

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TRANSPORTATION
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Chapter Number	Title	Page Number
1.0	INTRODUCTION	1.1
1.1	Background	1.1
1.2	Objective and Scope	1.1
1.3	Study Area	1.2
2.0	SURVEY PROCEDURE	2.1
2.1	Introduction	2.1
2.2	Selection of Survey Stations	2.1
2.3	Design of Interview Form	2.2
2.4	Survey Duration and Timing	2.2
2.5	Survey Logistics, Sampling Procedure and Sample Size	2.3
2.6	Crew Hiring and Training	2.8
2.7	Data Capture	2.8
3.0	DATA EXPANSION	3.1
3.1	Introduction	3.1
3.2	Expansion of Survey Day to Represent Survey Period	3.1
3.3	Expansion of Survey Period to 24-Hour Survey Day	3.3
3.4	Adjustment of Survey Day to Average Day of the Survey Week	3.3
3.5	Adjustment of Survey Week for Seasonality	3.4
3.6	Multi-Count Factors	3.4
4.0	DATABASE DEVELOPMENT	4.1
4.1	Introduction	4.1
4.2	File Creation	4.1
4.3	Expansion Factor File Addition	4.2
4.4	System File Description	4.3
4.5	File Weighting	4.3
4.6	AADT Comparisons	4.12
4.7	Comparison With Other Databases	4.14

APPENDIX A - SURVEY PROCEDURES MANUAL

APPENDIX B - CODING MANUAL

APPENDIX C - DATA EDITING LOGIC CHECKS

APPENDIX D - SAMPLE CALCULATIONS FOR EXPANSION FACTORS

LIST OF TABLES

Table Number	Title	Page Number
2.1	Survey Station Duration and Timing	2.4
4.1	SPSS System File Description (1990/1991 O-D Data)	4.4
4.2	Comparison of Expanded AADT Estimates With Permanent Station AADT Values	4.13

LIST OF FIGURES

Figure Number	Title	Follows Page Number
1.1	Fredericton - Moncton TCH Routing Options	1.1
2.1	Interview Station Locations	2.1
2.2	New Brunswick Department of Transportation Origin-Destination Survey 1990-1991 Interview Form	2.2
2.3	Station Set-Up and Signing Format For Approaches With Wide Shoulders	2.6
3.1	Manual Classification Recording Form	3.2

1.0 INTRODUCTION

1.1 Background

Over the last few years the Department of Transportation has directed efforts at preparing plans for upgrading the Trans Canada Highway through New Brunswick and the connecting links to Saint John. Most of the planning to date has been concentrated on upgrading these highways in the same general corridor. Previous efforts have indicated approximately 40 percent of the existing alignment can be salvaged while the remaining 60 percent will have to be by-passed in some form or another. Twinning, where possible, reduces overall construction costs and reduces the impact on communities which have had traditional access to the Trans Canada Highway in the past.

One of the areas of the highway network under review for upgrading, and in which a general corridor has not been identified to date, is the route between Fredericton and Moncton. The Department has identified two possible options, including:

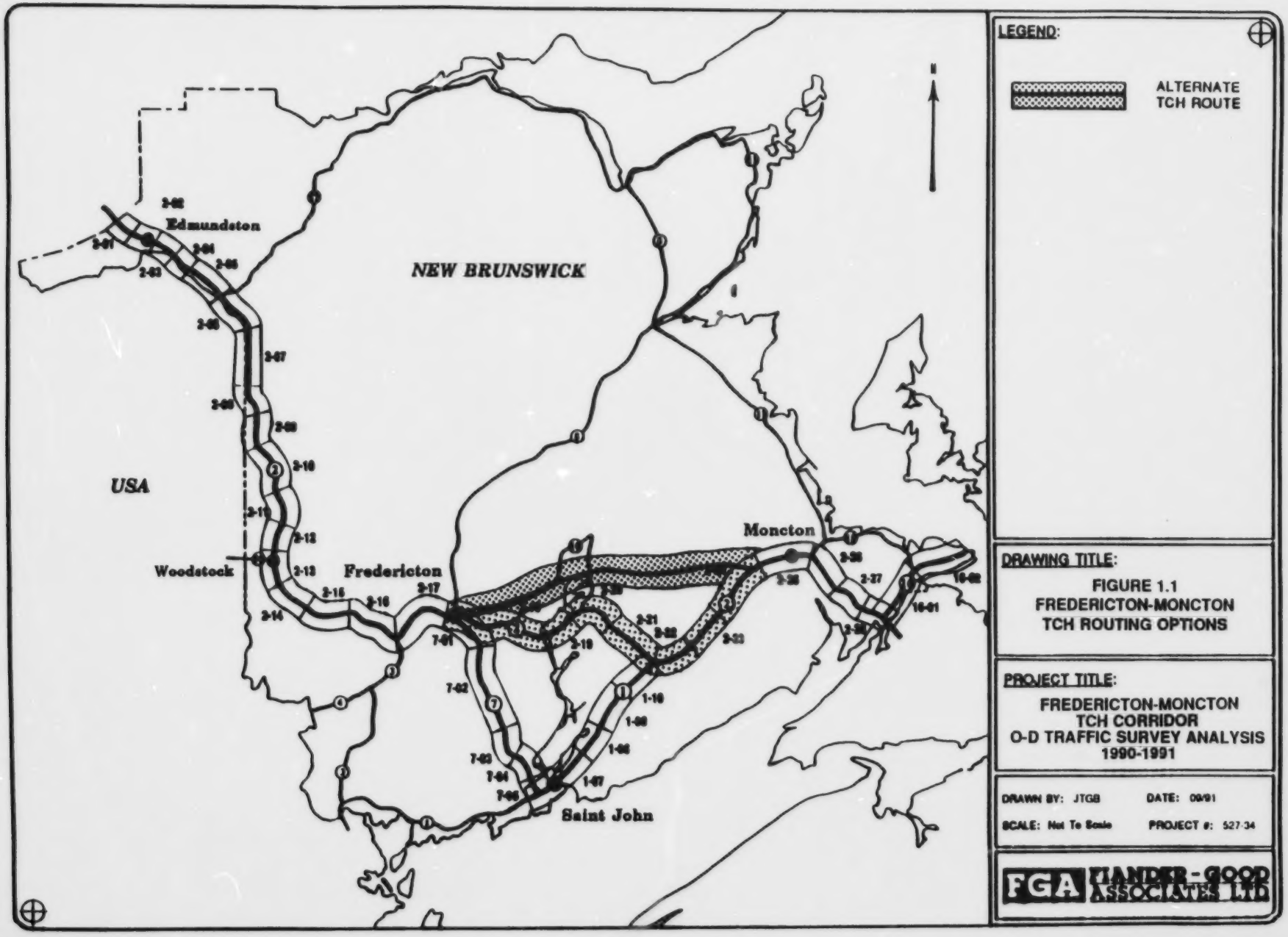
1). a corridor north of Grand Lake direct to Moncton; and

2). a corridor through CFB Gagetown to Jemseg and then an alignment generally following the existing route to Sussex and Moncton.

These corridor options are illustrated in Figure 1.1. No firm decision has been reached as to which corridor will provide the most efficient and economic link between Fredericton and Moncton. However, to assist in the selection of the appropriate corridor, up to date traffic characteristics and travel demands between Fredericton and Moncton are required as soon as possible.

1.2 Objective and Scope

Since past origin-destination studies were completed between 7 and 12 years ago and focused on different components of the traffic stream, the primary objective of this project was to develop traffic and travel characteristic data which, in future studies, will facilitate the determination of the traffic volumes that would be attracted to each of the highway corridors listed above and the implications on the


NEW BRUNSWICK
USA
Edmundston
Woodstock
Fredericton
Moncton
Saint John
LEGEND:
ALTERNATE TCH ROUTE
DRAWING TITLE:
FIGURE 1.1
FREDERICTON-MONCTON
TCH ROUTING OPTIONS
PROJECT TITLE:
FREDERICTON-MONCTON
TCH CORRIDOR
O-D TRAFFIC SURVEY ANALYSIS
1990-1991
DRAWN BY: JTGB
DATE: 09/91
SCALE: Not To Scale
PROJECT #: 527-34
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existing highway system. To enable these types of analyses to be completed, it is necessary to obtain up to date origin-destination travel data and routings between Fredericton and Moncton for all vehicle types. These data would complement and update previous regional origin-destination data.

1.3 Study Area

In general terms, the Study Area includes highways in the vicinity of Fredericton, Chipman, Minto, Sussex, Moncton and Saint John. The origin-destination survey provides sufficient data to determine intercity traffic volumes on the major highways connecting these communities. The data were collected for an off-peak travel period in 1990 (November) and a peak travel period in 1991 (July).

2.0 SURVEY PROCEDURE

2.1 Introduction

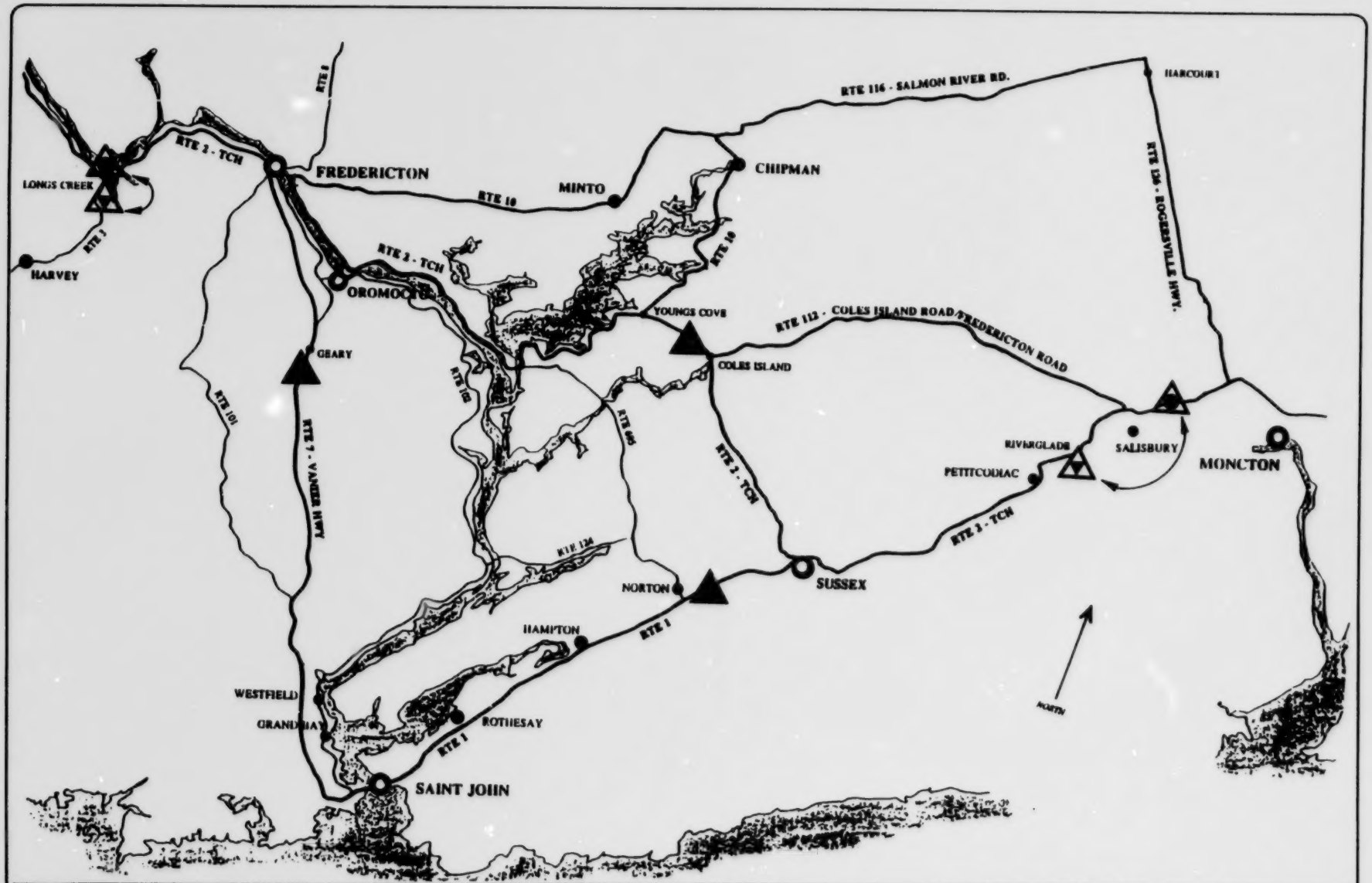
Since the timing of this project required data to be collected as quickly as possible, the fall survey was conducted in November, 1990. This necessitated a reduced preparation schedule for completing the survey. This chapter describes the various work activities which were completed together for both the fall and summer survey.

2.2 Selection of Survey Stations

To meet this project's objective to develop traffic and travel demand characteristics which will assist the Department in selection of an appropriate corridor for the Trans Canada Highway between Fredericton and Moncton, survey data were required to reflect travel on Routes 1, 2, 7, 10 and 112 with respect to the movements associated with the two potential corridors between Fredericton and Moncton. It was decided, after reviewing the Study Area highway network, that five survey stations would provide sufficient coverage to identify traffic and travel characteristics associated with the Study Area. The survey station locations are shown in Figure 2.1 and include:

1). at Longs Creek on Route 2 (Route 2, control section 21, rating section 1);
2). at Coles Island on Route 2 (Route 2, control section 30, rating section 1);
3). between Moncton and Salisbury on Route 2 (Route 2, control section 38, rating section 1);
4). on Route 7 south of the Foss Road at Geary (Route 7, control section 4, rating section 1); and
5). on Route 1 near Norton (Route 1, control section 19, rating section 1).

Survey stations 1 and 3 were selected to function as overall control stations. They are basically on the cordon boundary of the Study Area and provided the through movements between Fredericton and Moncton and areas to the west and east, respectively. These locations also provided an opportunity to complete 24 hour



Legend:		Project Title: FIGURE 2.1 INTERVIEW STATION LOCATIONS	FGA FIANDER-GOOD ASSOCIATES LTD.		Date: 08/1991
▲ INTERVIEW STATION All Traffic ▲ INTERVIEW STATION Non-Trucks Only ▲ INTERVIEW STATION Trucks Only		Drawing Title: FREDERCITON/MONCTON TCH CORRIDOR O-D TRAFFIC SURVEY ANALYSIS 1990-91	Scale: Not to Scale	Drawn by: JTGB	Job No: 527-34

truck interviews at the weigh scales. The Riverglade weigh scales (Route 2, control section 37, rating section 2) were used to survey trucks for the Moncton station, as was Longs Creek weigh scales (Route 3, control section 1, rating section 1) at the Longs Creek survey station.

Station 2 provided an opportunity to interview traffic prior to or after their travel on either Route 112 or the Sussex side of Route 2. Station 4 provided the necessary data for travel between Fredericton and Saint John, while Station 5 captured the Saint John - Moncton travel demand.

Each of the sites was visited prior to the survey. The actual locations were selected on the basis of maximum visibility and safety to the survey crew members. The two weigh scale locations enabled truck drivers to be interviewed off the travelway and thus provided maximum protection to the crew, especially during the 24 hour surveys, when interviewing was conducted at night.

2.3 Design of Interview Form

Immediately following award of contract, a questionnaire was designed and submitted to the Department for review and comments. Figure 2.2 illustrates the questionnaire which was utilized for both the fall and summer survey. The questionnaire was formatted in a manner which enabled efficient recording of field data, data coding, data keypunching and verification.

The completion of the questionnaire required a combination of observed data and data obtained directly from the roadside interview with the driver. The observed data include (see Figure 2.2) the interviewer name, sheet number, interview station number, travel direction, date, time, vehicle type, number of axles and number of occupants. The data obtained from the interview with the driver include overall origin and destination, intermediate stops and associated stop purpose, overall trip purpose and route taken.

2.4 Survey Duration and Timing

The roadside origin-destination survey was completed for two travel periods, the off-peak period which was represented by the month of November, 1990 and the peak travel period represented by the month of July, 1991. During the off-peak period interviews were conducted between 0800 and 1700 hours, a nine hour time

FIGURE 2.2

NEW BRUNSWICK DEPARTMENT OF TRANSPORTATION
ORIGIN - DESTINATION SURVEY 1990-1991

Interviewer: _____ **Sheet No:** _____

Interview Station No: ___ ☐ **Travel Direction:** ___ ☐ **Date:** _____ ☐☐☐☐ **Hour Period Beginning:** _____ AM PM ☐☐

	Vehicle Data			Origin and Destination		Intermediate Stops				Trip Purpose (Overall)	What Route are you Taking Between your Origin and Destination ?
	Classification / Vehicle Type	# of Axles	# of Occupants	Where are you COMING FROM Today ? Town / Province / State	Where are you GOING TO Today ? Town / Province / State	Did you make any Stops since you Started ? Town / Province / State	Purpose of Stop	Will You Make a Stop before you reach your Destination ? Town / Province / State	Purpose of Stop		
	1	2	3	4	5	6	7	8	9	10	11
1											
2											
3											
4											
5											
6											
7											

Vehicle Type:
1. Car/Van/Pick-up
2. Car/Van/Pick-up with Trailer
3. Motorcycle
4. Bus
5. Single Unit Truck
6. Single Unit Truck with Trailer
7. Tractor
8. Tractor-Trailer
9. Tractor-Trailer with Trailer
10. Mobile Home
11. Recreational Vehicle - RV
12. Other

Purpose of Stop:
1. Business
2. Work
3. Vacation
4. Recreational
5. Visit Family or Friends
6. Personal
7. Shopping
8. Goods Drop-off/Pick-up
9. Food / Fuel
10. Rest Stop
11. Other

Overall Trip Purpose:
1. Business
2. Work
3. Vacation
4. Recreational
5. Visit Family or Friends
6. Personal
7. Shopping
8. Goods Movement
11. Other

Travel Direction
1. Eastbound
2. Westbound
3. Northbound
4. Southbound

frame. It was not feasible from a safety point of view to conduct the survey without daylight.

In the peak period interviews were conducted from 0700 to 1900 hours, a twelve hour time frame. This enabled all interviews to be conducted in the daylight hours. Table 2.1 summarizes the dates and duration of each of the survey periods at the survey stations. At the Longs Creek and Riverglade weigh scales, trucks were interviewed for a 24-hour period (0700 to 0700 hours) during both survey periods.

2.5 Survey Logistics, Sampling Procedure and Sample Size

Survey Logistics

As a result of time constraints in the fall survey, as well as the location of the five survey stations, one survey crew during each of the survey periods was hired to collect the survey data. This approach reduced the actual number of people who had to be trained and provided consistency throughout the survey periods. This approach also reduced major equipment requirements such as information and regulatory signs, portable traffic counters and safety wear. Crew members were also able to obtain a reasonable number of working hours and thus were willing to remain throughout the survey period.

Sampling Procedure and Size

During the proposal stage preparation for this project, research was completed with respect to sample size. The Ministry of Transportation and Communications of Ontario published a paper entitled Optimal Sample Size of Roadside Interview Origin-Destination Surveys in 1977. This document indicates that for busy intercity routes with commuter traffic (ie. in the 3,000 to 5,000 AADT range) a 12 hour bidirectional sampling procedure should be utilized where possible. The document further states that for evaluating alternate highway routings and their implications, a 20 to 40 percent sampling rate would be sufficient. The higher the traffic volumes at an origin-destination survey station, the lower the sampling rate required.

Sampling rates in the 20 to 40 percent area at survey stations similar to those utilized in this project will generally produce root mean square errors in the 10 to

TABLE 2.1

SURVEY STATION DURATION AND TIMING

Survey Station	Off-Peak Survey Period		Peak Survey Period	
	Date	Time	Date	Time
Geary	November 7/90	0800 to 1700	July 3/91	0700 to 1900
Longs Creek *	November 8/90	0800 to 1700	July 9/91	0700 to 1900
Coles Island	November 14/90	0800 to 1700	July 11/91	0700 to 1900
Norton	November 15/90	0800 to 1700	July 16/91	0700 to 1900
Moncton/Riverglade *	November 21/90	0800 to 1700	July 17/91	0700 to 1900

* Trucks were interviewed for a 24 hour period at these locations (ie. 0700 to 0700 hours).

15 percent range if interviewing is bidirectional over a 12 hour period. This level of accuracy should be adequate for the type of information required. To attain this level of accuracy a 40 percent sampling rate was selected for the off-peak period and a 20 percent sampling rate for the peak survey period. During the off peak period a 43.7 percent sampling rate was achieved overall with a 46.6 percent truck sampling rate. In the peak period an overall sampling rate of 46.1 was obtained with a truck sampling rate of 52.7 percent.

It was initially estimated the above minimum sampling rates (ie. 20 and 40 percent) would result in capturing between 11,000 and 13,000 interviews. There were 5,911 interviews collected in the off-peak period and 12,033 interviews in the peak. This represents a total of 17,944 interviews. The high sampling rate in the peak period was maintained because of more interviewers, more continuous interviewing without breaks and reduced summer traffic volumes.

Control Counts

In addition to the actual interviewing, additional control counts were obtained at each survey station to permit the expansion of the sample to represent AADT volumes throughout the study network. The following control counts were completed during each survey period, while a discussion of their use in expanding the sample is provided in Chapter 3.0.

1). For the survey period at each station (ie 9 or 12 hours) a manual classification count was completed on a directional basis.

2). For the 24 hour survey period, tube classification counts were taken on a directional basis at each survey station.

3). For the 24 hour survey period at each station axle counts were obtained as a back-up for the tube classification counts.

4). 24 hour truck interview and manual vehicle classification counts were completed at the Longs Creek and Riverglade weigh scales for each survey period.

5). Seven day classification counts were obtained at Geary, Longs Creek, Coles Island, Norton and Riverglade for each survey period from the

permanent count stations. The classification equipment at these locations classify vehicles by length which is sufficient to identify hourly, daily, weekly and seasonal variations in traffic volumes.

Station Set-up

The actual site location at each survey station was selected to maximize safety for both the crew and the travelling public. Sufficient room was available to permit vehicles to be removed from the traffic flow stream while the driver was being interviewed. This allowed the other vehicles sufficient space to proceed through the survey station at a reduced speed without being stopped. The station set-up for each direction included the following:

1). A flagperson who was responsible for directing the vehicles back into the traffic stream once the interview was completed.

2). A member of the Commercial Vehicle Enforcement Branch of the Solicitor Generals Office with full uniform and marked vehicle. This individual was responsible for slowing traffic down as it approached the survey station and to direct traffic into the interview station and/or to direct traffic through without stopping.

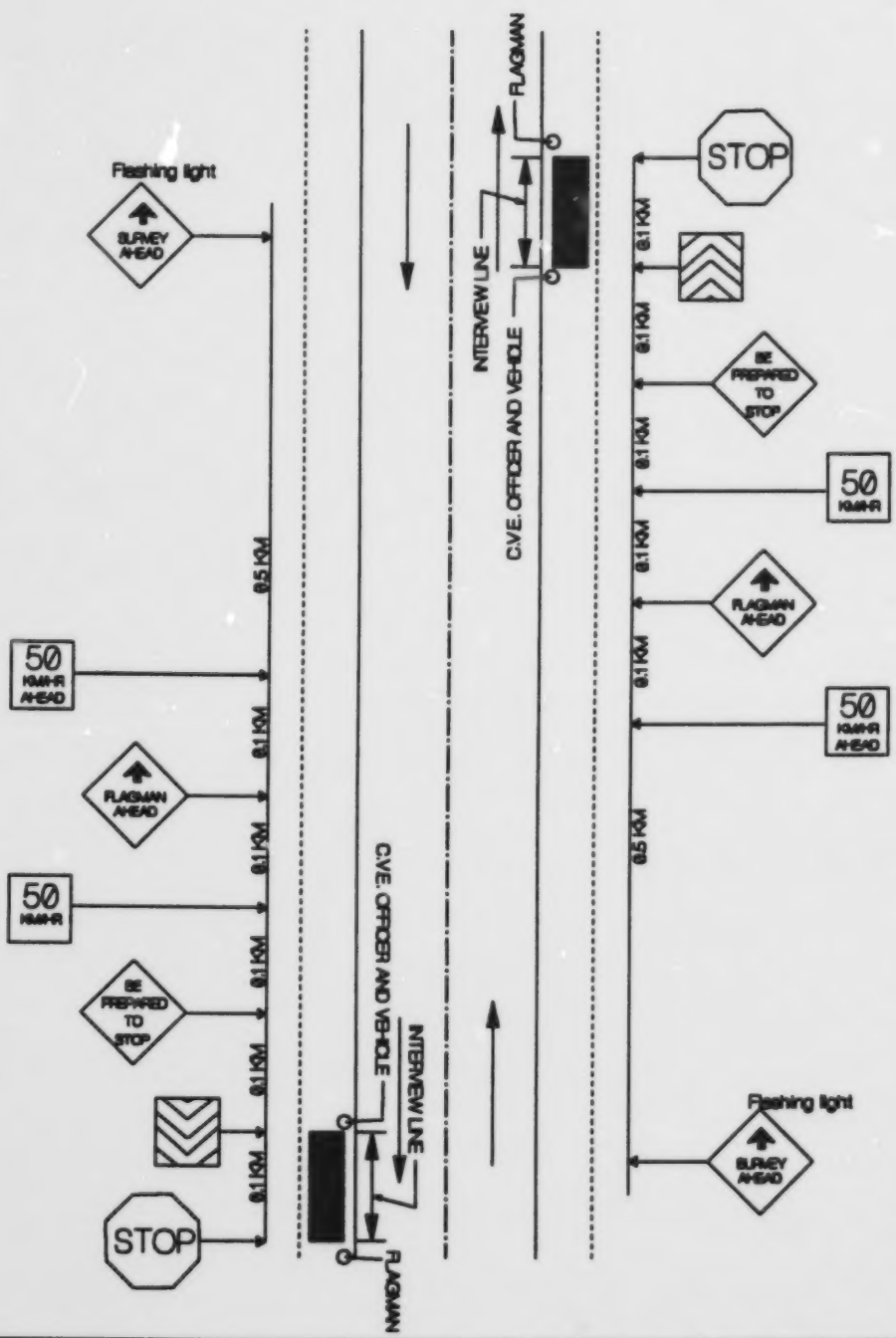
3). Interviewers to obtain the required data from drivers directed into the survey station.

4). Pylons to separate the interview area from the travelway. These pylons were connected with rope to act as a reminder and to prevent the interviewer from backing into the travelway.

5). A system of warning signs to advise motorists about the survey. A typical station set-up and system of signs is shown in Figure 2.3.

In addition to the above station set-up, the RCMP were contacted to advise them of the survey schedule. This permitted them to visit each site once or twice during the survey to ensure everything was going smoothly.

It can be appreciated that safety is a major concern when completing roadside origin-destination surveys. Thus it was essential that every precaution possible be



Legend:

C.V.E. - Commercial Vehicle Enforcement

Drawing Title: FIGURE 2.3
STATION SET-UP AND SIGNING FORMAT
FOR APPROACHES WITH WIDE SHOULDERS

Project Title:
FREDERICTON/MONCTON TCH CORRIDOR
O-D TRAFFIC SURVEY ANALYSIS 1990-91

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Project No: 527-34

taken to ensure the safety of the crew and travelling public. One of the major improvements this survey had with respect to previous surveys was the use of the Commercial Vehicle Enforcement officers. They provided a high visibility component to the survey station and ensured maximum safety at the site. However, there were still a few incidents which occurred as a result of primarily vehicle driver disrespect for appropriate safety procedures as directed by the officers, the flagpersons and the warning signs and markings.

Manpower Requirements

Each survey station included the following personnel to ensure the appropriate sampling rate was obtained and that crew members could be given a break periodically:

- a crew chief who was on site continuously;
- a traffic classifier;
- two Commercial Vehicle Enforcement officers;
- two flagpersons; and
- eight to ten interviewers.

Equipment Requirements

Each survey station required a certain amount of equipment to ensure proper safety and operational procedures were followed along the roadside. The following major items of equipment were used:

- Two sets of advance and survey station location signing (one for each direction) as shown in Figure 2.3. These signs include: TRAFFIC SURVEY AHEAD (including a flashing yellow beacon with battery), 50 KM/H AHEAD, FLAGMAN AHEAD, 50 KM/H, BE PREPARED TO STOP, CAUTION and STOP.

- Safety hats, safety vests, a traffic counter board, traffic cones, rope, temporary traffic counters, classifiers and tubes.

- Clipboards, questionnaire forms, batch envelopes, pencils, and miscellaneous supplies and equipment (ie. pencil sharpeners, erasers, rain gear).

- A crew chief van and two Commercial Vehicle Enforcement automobiles with flashing lights.

2.6 Crew Hiring and Training

During both survey periods, Canadian Employment and Immigration were contacted and interviews arranged with potential survey crew members. Each potential member was given an explanation of the types of activities involved and the level of effort required. Those crew members selected were then given a one day instructional session relating to the survey procedure. Specific consideration was given to safety in the field and a thorough understanding of the various questions included on the interview form.

Each crew member was trained with respect to interviewing, flagging and traffic classification. A procedures manual was developed to assist in the training session and examples given with respect to various travel characteristics. Appendix A includes this procedures manual.

2.7 Data Capture

Once the data were collected by the survey crew at the various survey stations, the data capture activity commenced. The term data capture has been used here to describe the data coding, data entry and data editing procedures necessary to develop a clean and usable data file for analytical purposes. The data capture process actually began as soon as the data were brought into the office from the various survey stations.

Data Coding

To assist in data coding, the survey crew was trained and periodically checked to ensure the questionnaires were filled out legibly, accurately and completely. The questionnaire was designed to assist the coding procedure and a coding manual was prepared to ensure all questionnaires were coded consistently (see Appendix B). A brief explanation of the numeric coding system for each question is given below. Reference should be made to Figure 2.2 (the interview form) while reading the description below.

Each survey station was assigned a numeric number ranging from 1 to 7. Although there were only 5 survey stations, the truck surveys conducted over the 24 hour period at the weigh scales were assigned a separate station number. Travel direction was assigned a number between 1 and 4, depending on the direction of travel. The date of the survey and the hour in which the interview was completed were also assigned a numeric value.

The type of vehicle was assigned a value between 1 and 12. Figure 2.2 summarizes the value assigned to each vehicle type. A numeric value was also assigned to the number of axles each vehicle had, as well as the number of occupants.

Each origin and destination, as well as the intermediate stops were assigned a 5 digit numeric code. This numeric code system was initially developed in 1969 when the Atlantic Provinces Air Transportation Study (APATS) was completed for the Atlantic Region. Since that time various origin - destination studies have used this numeric system and have added to the place names. Basically each origin and destination is given a five digit code. The first two digits represent the province or state while the last three digits represent the actual place name.

The coding system for the purpose of the intermediate stops and the overall trip purpose is included on the questionnaire (see Figure 2.2). A coding procedure for the route taken was developed once all the interviews were completed. A value of 1 was assigned if a vehicle utilized the TCH between Fredericton and Moncton, a value of 2 was assigned if Route 112 was taken while 3 was assigned if the Salmon River Road was taken.

Data Entry

Once the data were coded in the appropriate format each record was entered into the computer utilizing the computer software package called SPSS DATA ENTRY II. This package enables data to be entered either in spread sheet format or a screen can be designed to reflect the actual questionnaire. The big advantage of this computer package is its ability to edit data and produce a clean data file.

Data Editing

The SPSS DATA ENTRY II package is capable of completing both range and logic data checks and identifying any records which do not meet the specifications. Initially, when data are entered, a range check is made and any keypunching errors identified. For example, the range specification for the variable describing vehicle type was 1 through 12. Thus if any other number were entered, a possible error was immediately flagged.

Once the data were entered, several data checks were performed. Some, but not all of the logic checks included:

1. origin should not be equal to destination;
2. if the vehicle type is a passenger car or a motorcycle, the number of axles should be two, and
3. if the survey station is Geary, the travel direction is either north or southbound.

If any record failed the various logic checks, the record identification number was printed out, a check of the field form was completed and the appropriate correction made. Appendix C lists the various logic checks which were made.

3.0 DATA EXPANSION

3.1 Introduction

A description of the methodology used to expand the survey data to represent average annual daily traffic (AADT) levels is presented herein. The same methodology has previously been used to successfully expand sample data associated with the 1979 New Brunswick Travel Survey in addition to the 1984 Atlantic Provinces Truck Survey. The expansion process involves the following steps:

1). Expansion of the survey station interview data to represent the 9 or 12 hour survey period (FSP).

2). Expansion of the survey period data to the 24 hour survey day (FSD).

3). Adjustment of the survey day to an average day of the survey week (FSW).

4). Adjustment of the survey week to account for seasonality (FS).

5). Development of multi-count factors to enable the five survey stations to be used collectively for evaluation purposes.

Appendix D presents an example of the calculations required to develop the expansion factors.

3.2 Expansion of Survey Day to Represent Survey Period

In order that the sampled survey data could be expanded to match the total traffic volumes associated with the duration of the survey period, all vehicles passing through the survey station (whether sampled or not) were counted by type and direction. The total volumes were disaggregated directionally into vehicle categories in order that more discrete expansion factors could be generated, resulting in a more representative database. For example, the travel characteristics of tractor- trailers, automobiles, straight-trucks, and recreational vehicles (RV's) are

all different and require individual treatment to expand a sample to the population.

Both manual and mechanical vehicle classification counts were taken at each station throughout the survey period (see Figure 3.1). Manual counts were taken directionally by field personnel with the vehicles being recorded into one of the following 12 groupings: car/van/pick-up; car/van/pick-up with trailer; motorcycle; bus; single unit truck; single unit truck with trailer; tractor; tractor-trailer; tractor-trailer with trailer; mobile home; recreational vehicle; and other. These vehicle classifications correspond with those used to identify the vehicle types on the actual survey forms.

Mechanical counts were also taken adjacent to the survey sites using Golden River Marksman 600 counters. These counters have the capability of classifying individual vehicles using a logistic routine based on the vehicle's length and axle configuration. The vehicle counts are filed into classification bins which correspond to the 13 standard Federal Highway Administration vehicle categories, namely: motorcycle; car/van/pick-up; heavy-duty pick-up; bus; 2-axle truck; 3-axle truck (2 categories); tractor-trailers (3 categories); tractor-trailers with trailers (3 categories).

The manual counts were originally intended to be used as a back-up and cross-check of the mechanical counts, however on different occasions the mechanical counters failed for one reason or another so the manual counts were used in some instances. Battery failures, software problems, broken tubes, and calibration difficulties were some of the problems encountered with the mechanical classification counters. Nevertheless, a high level of confidence is associated with the manual counts given that they closely corresponded with the tube classification counts at the stations where the counters worked properly.

Given that the classification bins associated with the mechanical counters are slightly different than those used on the survey forms and by the manual classifiers, a classification scheme had to be derived which is common to both systems. Ultimately, the vehicles were coded into one of 6 bins for the purpose of developing expansion factors for the survey period. The categories were: motorcycle; car/van/pick-up with/without a trailer and others; single unit trucks/tractors/and RVs; buses; single unit trucks with trailers/tractor-trailers/and mobile homes; tractor-trailers with trailers.

FIGURE 3.1
MANUAL CLASSIFICATION RECORDER FORM
N. B. DEPT. OF TRANSPORTATION ORIGN-DESTINATION SURVEY
VEHICLE CLASSIFICATION TALLY SHEET

ecorder:_____ Time Period:_____ Station #:_____

ate:_____ Hour Period Beginning:_____ Weather:_____

Vehicle Type	From Route: ← ↑ →	From Route: ← ↑ →	From Route: ← ↑ →	From Route: ← ↑ →	Total
1. Car/Van/Pick-up					
2. Car/Van/Pick-up with Trailer					
3. Motorcycle					
4. Bus					
5. Single Unit Truck					
6. Single Unit Truck with Trailer					
7. Tractor					
8. Tractor-Trailer					
9. Tractor-Trailer with Trailer					
0. Mobile Home					
1. Recreational Vehicle - RV					
2. Other					
Total					

The actual expansion factors to growth the survey data to the survey period were developed by dividing the total counted vehicles (according to classification and direction) by the actual number interviewed.

3.3 Expansion of Survey Period to 24-Hour Survey Day

Since the actual survey duration was only typically a 9 or 12-hour segment during a given day, it was necessary to expand the data to represent the actual 24-hour period encompassing the survey day.

Whenever possible, the data collected by the mechanical tube classifiers were utilized as the basis to expand the survey period data given its disaggregation of the counts by vehicle categories. Daily volumes by classification and direction were divided by survey period totals to develop the factors. However, as previously mentioned, on several occasions the classifiers failed. Since manual counters were typically only recording information during the actual survey period another source of count information had to be utilized in those cases where the mechanical classifiers failed. Typically information being recorded on an hourly basis by the permanent counter stations was found to be the best source. In most cases they were located in close enough proximity to the survey site to accurately represent volumes flowing through the site. While the permanent counters classify vehicles according to length, only three classifications could be developed which correspond to the data being collected. These included; cars/vans/pick-ups; single unit trucks; and tractor-trailers. As a result, all vehicle types at stations where the mechanical classifiers had failed had to be represented by one of these three categories for the purpose of assigning a daily expansion factor. Information from axle tube counters was normally available as well, however, reliable calibration factors to account for multi-axle vehicles were not available.

3.4 Adjustment of Survey Day to Average Day of the Survey Week

Data collected by permanent count stations adjacent to the survey stations were used to adjust the actual survey day to an average day of the survey week. The permanent counter stations record hourly volumes, 24 hours per day. Daily totals of vehicles (by one of three categories described above) for each day of the actual survey week were averaged and compared to those of the survey day. Adjustment factors were then calculated for each vehicle category and direction of travel.

3.5 Adjustment of Survey Week for Seasonality

Given that traffic patterns fluctuate depending on the time of year the actual survey week had to be adjusted to represent an average week of the year. This was accomplished by assuming the survey week was representative of an average week during the survey month and adjusting the survey month for an average month of the year. The monthly adjustment factors were extracted from a report prepared by Geoplan entitled *"New Brunswick Department of Transportation Traffic Counting Study, 1989.* The report contains tables with adjustment factors for the appropriate permanent count stations.

The seasonal variation factors were the last adjustment necessary to develop AADT and AADTT values at each survey period. Since a survey was done during both peak and off-peak periods (November and July) the two estimates were weighted and averaged. The peak season data are representative of 77 summer days, while the off-peak data are representative of the remaining 288 days. These values are the same as those chosen to represent the 1979 travel survey data and were chosen to maintain consistency.

3.6 Multi-Count Factors

When the stations are expanded to represent AADT/AADTT values, they have to be further adjusted to accommodate for the multi-counting of trips. In other words, when all stations are evaluated together it is possible that the same trip can be counted twice given that the survey stations were not manned simultaneously. These factors were developed utilizing the methodology developed during the previous provincial origin-destination surveys. The values range from 0.250 to 1.000. An example is given below as to how the factor was calculated.

A truck travelling between Montreal and Halifax could potentially be stopped and the driver interviewed a total of 3 times, the number of survey stations between these two points. To prevent counting this trip more than once, since it is only one trip, the driver should be asked at stations along the route if he had been interviewed previously. This could be readily done if all stations along the route were surveyed simultaneously. However, as previously stated, limited manpower and equipment resources eliminated the use of this interviewing method.

The data collected in the field included all interviews which were conducted and these data have been expanded to AADT values. As a result, there is the possibility that trips could be counted more than once if adjustment factors are not developed and placed on the data file. For example, consider the truck trip between Montreal and Halifax referred to above. This particular truck would pass through 3 survey stations before reaching its destination. Assuming only 1 station has field crews on duty during that particular day, then there are two stations unmanned.

However, there is an equal probability that this particular truck trip would be interviewed and included in the manual classification counts at each of the three stations on the route, if they were all manned by survey crews. Therefore, with a 100 percent sample, the same trip would be recorded three times as three separate trips, which is not accurate and represents multiple counting, especially with respect to long distance trips.

The problem occurs when the survey station volumes are expanded to represent average annual daily traffic, since each trip is expanded accordingly. More specifically, a trip which passed through previous stations (with an equal probability of being interviewed) would theoretically be expanded at each station. Therefore, the possibility exists of long distance trips being counted more than once, and if not adjusted, the data would contain a bias towards long distance trips. In the case of the Montreal to Halifax trip with only one station manned, this long distance trip could be expanded to represent 3 different trips and would seriously affect evaluation results.

If analysis is completed on individual stations, no adjustment is necessary since the trips are expanded on a station basis. However, if regional analysis is done with two or more stations, then adjustment factors must be applied to reflect this increasing bias towards long distance trips. These factors are referred to as multiple count adjustment factors and have been applied to the data base on a link by link basis. In the example of a trip between Montreal and Halifax, the factor would be .333. If the trip had the potential of passing through 1, 2 or 4 stations, the multi-count factor would be 1.000, 0.500 or 0.250, respectively.

4.0 DATABASE DEVELOPMENT

4.1 Introduction

Based on previous roadside survey experience, it was decided to use the SPSS/PC+ software package for creating and weighting the peak and off-peak databases. The SPSS software package is very useful in producing various frequency distributions, trip tables and statistical summaries. SPSS also permits convenient data manipulation operations and transformations.

During database development, the peak and off-peak files were developed and expanded to represent AADT separately, then combined to represent one overall database. This overall database can be weighted to represent a yearly traffic total or AADT values, depending on the type of analysis required. The methodology for weighting the file for the appropriate type of analysis is described in detail later in this chapter.

The intent of this chapter is to describe the file creation approach, how the expansion factors, which were described in Chapter 3.0, were added to the database, to provide a description of the database, including all variables, to describe how to weight the file and to compare the results with previous efforts. This chapter can be used as a user manual for accessing the origin-destination SPSS system file.

4.2 File Creation

The SPSS software package enables the user to create a system file which can describe each variable and its values. Data can initially be entered in ASCII format, spreadsheet format (LOTUS 1-2-3, Symphony, Multiplan or other programs) or dBase format. In addition, the SPSS DATA ENTRY II option also can be utilized for data input. This software option was utilized during file creation since all data capture activities were completed using DATA ENTRY II, and as a result, an SPSS system file was initially completed, with the various variables already assigned an abbreviated name.

When data is initially entered into SPSS, a system file is created by defining where the variables are located on each record or case and assigning each variable a

unique name. Following this, the file can be enhanced by more fully describing each variable name, assigning value labels to each variable value and identifying missing data values.

The origin-destination database file describes each variable and value in detail, and together with the written description provided in Section 4.4, should be easy to access and use by anyone familiar with SPSS.

4.3 Expansion Factor File Addition

With the SPSS system file developed and adequately defined, the next step involved adding the expansion factors to the file and weighting each survey station to ensure AADT values were accurate. The methodology for calculating the various expansion factors is presented in Chapter 3.0.

Four expansion factors were added to the SPSS system file and include:

FSP - A factor to expand the survey sample to the survey period.

FSD - A factor to expand the survey period to the 24-hour survey day.

FSW - A factor to adjust the 24-hour survey day to the average day of the survey week.

FS - A factor to adjust the average day of the survey week to an average day of the year.

By applying these expansion factors to the SPSS file, each survey station can be expanded to represent AADT values.

To apply each of the above factors to the SPSS system file, several conditional statements were developed. For example, to add the appropriate FSP factor to a record, a conditional statement would be included specifying the station number, the travel direction and the vehicle type (ie. IF [VTYPE EQ 1 and STNNO EQ 1 and TDIR EQ 1] FSP = 2.344). Each expansion factor (FSP, FSD, FSW, and FS) has been calculated based on the above three variables. Thus each specific record has the four expansion factors added to it.

A description of how the SPSS system file is weighted to represent AADT values, as well as other values, is given in Section 4.5.

4.4 System File Description

The system file includes both peak and off-peak origin-destination records which can be expanded to represent either annual or AADT volumes. There is a total of 17,944 records on the file, representing travel to, from and throughout the Study Area.

This section provides a detailed description of each of 38 variables on the system file. Three of the 38 variables are SPSS system variables. The description is presented in Table 4.1.

4.5 File Weighting

There are a number of ways of weighting the database file to represent specific traffic volumes, depending on the type of analyses to be completed. This section describes the different procedures.

As indicated previously, the peak and off-peak files have been combined, representing almost 18,000 records. It is intended that the peak interview records represent the peak travel season while the off-peak records are to reflect the remaining times of the year. Based on the 1979 travel survey, the peak data represents 77 days of the year while the remaining 288 days are represented by the off-peak data. The weighting of the file is based on these values.

A. Individual Survey Station Analysis

If it is required to expand the data to represent AADT values at specific survey stations in which analysis is station specific, the following procedure should be used:

> Each record should be multiplied by the variable WT2. This will provide AADT values at each station. WT2 has been calculated from the following SPSS commands.

TABLE 4.1

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
IDNO[1]	Interview ID Number	A unique number assigned to each interview record in ascending order.
INTVWR[1]	Interviewer Number	The number assigned to the interviewer.
STNNO[1]	Station Number	The number assigned to each survey station: 1. Longs Creek 2. Coles Island 3. Geary 4. Norton 5. Moncton/Riverglade
TDIR[1]	Travel Direction	Direction the vehicle was travelling when the driver was interviewed. 1. Eastbound 2. Westbound 3. Northbound 4. Southbound
DATE[1]	Date of Interview	Day of the month the interview was conducted, along with the month (ie. 117 would refer to the November 7th, 1990).
YEAR[1]	Year of Interview	Year the interview was conducted (either 1990 or 1991).
HOUR[1]	Beginning Hour	The hour of the day the interview was conducted. For example, a value of 0900 would indicate the interview was conducted between 0900 and 1000 hours.

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
VTYPE[1]	Vehicle Type	The type of vehicle interviewed. 1. Car/Van/Pick-up 2. Car/Van/Pick-up with Trailer 3. Motorcycle 4. Bus 5. Single Unit Truck 6. Single Unit Truck with Trailer 7. Tractor 8. Tractor-Trailer 9. Tractor-Trailer with Trailer 10. Mobile Home 11. Recreational Vehicle 12. Other
NO_AXLES[1]	Number of Axles	The number of axles on the vehicle.
NO_OCC[1]	Number of Occupants	The number of occupants in the vehicle.
ORIGIN[1]	Initial Trip Origin	The initial origin where the trip began the day of the interview. 0 Newfoundland 1000 Prince Edward Island 2000 Nova Scotia 4000 Rest of Canada 5000 United States 3000 to 3999 - These are locations in New Brunswick which can be determined from the APATS Node Manual.
DEST[1]	Final Trip Destination	This is the final destination where the trip will end the day of the interview. The values are the same as the variable ORIGIN.
PRINTS[2]	Previous Intermediate Stop	This is the place where the driver had made a major stop prior to the interview. A major stop purpose has been defined as business, work, and goods movement. The values for this variable are the same as the variable ORIGIN.

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
PRINTP[1]	Previous Intermediate Stop Purpose	The trip purpose for the previous intermediate stop. 1. Business 2. Work 3. Vacation 4. Recreational 5. Visit Family/Friends 6. Personal 7. Shopping 8. Goods Movement 9. Food or Fuel 10. Rest Stop 11. Other
EVINTS[2]	Next Intermediate Stop	This is the next place the driver will make a major stop. A major stop is defined the same as above. The values for this variable are the same as the variable ORIGIN. It is important to note that PRINTS and EVINTS should be used in any cross-tabulation which is needed to determine divertible traffic.
EVINTP[1]	Next Intermediate Stop	The trip purpose for the next intermediate stop. The values are the same as the variable PRINTP.
OVTRPURP[1]	Overall Trip Purpose	The overall trip purpose that is applicable to the variables ORIGIN and DEST. 1. Business 2. Work 3. Vacation 4. Recreational 5. Visit Family/Friends 6. Personal 7. Shopping 8. Goods Movement 11. Other

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
ROUTE[1]	Route Taken	At stations where there was a choice between one route over another (ie. Coles Island), the specific route was recorded. 1. Trans Canada Highway 2. Coles Island 3. Salmon River Road Note: Some values are blank
MLTCT[3]	Multi-Count Factor	This is a factor to eliminate any multi-counting of trips. This factor should be applied to the SPSS system file when two or more survey stations are being considered and the overall origins and destinations are utilized.
OZONE[2]	Initial Trip Origin Zone	This variable reflects the recoding of the variable ORIGIN into specific traffic zones which were utilized in the 1979 and 1984 origin-destination surveys. 0 Newfoundland 1000 Prince Edward Island 2000 Nova Scotia 4000 Rest of Canada 5000 United States 300 New Brunswick 301 Edmundston 302 St. Leonard 303 Grand Falls 304 Rilley Brook 305 Plaster Rock 306 Florenceville 307 Woodstock 308 Stanley 309 Douglas 318 Chipman 319 Gagetown 320 Sussex 321 Norton 322 Saint John 323 Hillsborough 324 Shediac 325 Moncton 326 Buctouche 327 Harcourt 328 Richibucto 329 Rogersville 330 Blackville 331 Millerton 332 Sunny Corner

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
OZONE (Continued)		310 Millville 311 Canterbury 312 Fredericton 313 Harvey 314 Minto 315 Oromocto 316 St. Stephen 317 St. George 333 Newcastle 334 Tracadie 335 Caraquet 336 Bathurst 337 Jacquet River 338 Campbellton 339 Robinsonville 340 St. Quentin
DZONE[2]	Final Trip Destination Zone	This variable reflects the recoding of the variable DEST into traffic zones. The values are the same as the variable OZONE.
PRZONE[2]	Previous Intermediate Stop Zone	This variable reflects the recoding of the variable PRINTS into the traffic zone structure. The values are the same as the variable OZONE.
EVZONE[2]	Next Intermediate Stop Zone	This variable reflects the recoding of the variable EVINTS into the traffic zone structure. The values are the same as the variable OZONE. It is important to note the PRZONE and EVZONE should be used in any cross-tabulation which is needed to determine divertible traffic.
BEFORE[1]	Previous Intermediate Stop	This variable describes the previous intermediate stop for any trip purpose, major or minor. The values are the same as the variable ORIGIN.
AFTER[1]	Next Intermediate Stop	This variable describes the next intermediate stop for any trip purpose, major or minor. The values are the same as the variable ORIGIN.

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
AFTERZN[2]	Next Intermediate Stop Zone	This variable represents the recoding of the variable AFTER into the traffic zone structure. The values of this variable are the same as the variable OZONE.
BEFOREZN[2]	Previous Intermediate Stop Zone	This variable reflects the recoding of the variable BEFORE into the traffic zone structure. The values for this variable are the same as the variable OZONE.
FSP[3]	Survey Period Factor	The factor used to expand the sample to the survey period.
FSD[3]	Survey Day Factor	The factor used to expand the survey period to the survey day.
FSW[3]	Survey Week Factor	The factor used to expand the survey day to the average day of the survey week.
FS[3]	Seasonal Factor	The factor used to adjust the average day of the survey week to an average day of the year.
WT[3]	Station Weight Factor	The factor used to weight the seasonal (peak or off-peak) survey station to an AADT value. WT = FSP * FSD * FSW * FS
WT1[3]	Annual Factor	The factor used to weight the survey data to annual values. WT1 = WT * 77 (peak period data) WT1 = WT * 288 (off-peak period data)

TABLE 4.1
(Cont'd)

SPSS SYSTEM FILE DESCRIPTION
(1990/1991 O-D DATA)

Variable Name	Variable Name Label	Variable and Value Description
WT2[3]	AADT Factor	The factor used to weight the peak and off-peak data to an AADT value. WT2 = WT1/365
WT3[3]	Regional Analysis Factor	This factor should be used to weight the file when reviewing two or more survey stations simultaneously and utilizing the previous and next intermediate stop variables. WT3 = WT2 * MLTCT1
MLTCT1[1]	Multi-Count Factor One	This is a factor to eliminate any multi-counting of trips. This factor should be applied to the SPSS system file when two or more survey stations are being considered and the previous intermediate stops and the next intermediate stops are utilized.

[1] These variables are taken from the survey questionnaire.

[2] These variables are derived from the survey questionnaire.

[3] These variables are calculated.

1. COMPUTE WT = FSP * FSD * FSW * FS
2. IF (DATE LT 800) WT1 = WT * 77
3. IF (DATE GT 800) WT1 = WT * 288
4. COMPUTE WT2 = WT1/365

The first command expands the individual records to an AADT value. The next 2 commands weight the file to represent yearly volumes, while the remaining command adjusts the file to represent weighted AADT values.

As an example, the following SPSS commands would be used to weight the file:

```
GET FILE = 'NBODPOP2.SYS'.
WEIGHT BY WT2.
```

B. Two Or More Survey Station Analysis

When evaluating or reviewing two or more survey stations at a time, consideration must be given to the possible multiple counting of trips because of the survey data collection procedure. For example, there were 3 survey stations located on the Trans Canada Highway (Longs Creek, Coles Island, and Moncton). If all three were operated simultaneously then trips west of Longs Creek and east of Moncton would be stopped at all three locations. This would then enable the interviewer to eliminate multiple counting of trips by asking the driver if he had been interviewed previously.

However, the stations were operated on different days and it was necessary to manually develop a factor to account for multiple counting. Thus if two or more survey stations are to be reviewed simultaneously, the file should be weighted by the factor WT3. This factor has been calculated in the following manner using SPSS command statements.

1. COMPUTE WT = FSP * FSD * FSW * FS
2. IF (DATE LT 800) WT1 = WT * 77
3. IF (DATE GT 800) WT1 = WT * 288
4. COMPUTE WT2 = WT1/365
5. COMPUTE WT3 = WT2 * MLTCT1

The first four statements are the same as described above. The fifth statement applies the multi-count factor to the weighted AADT factor to adjust for multiple counting.

C. Other Weighting Procedures

The above two methods probably represent the procedures which will be used most commonly. However, there may be occasions when some other weighting procedure may be desired. These are discussed below.

1. If a weighted annual traffic volume is desired on an individual survey station basis, then the file should be weighted by WT1.

2. If weighted annual traffic volumes for two or more stations that are to be evaluated simultaneously is desired, the file should be weighted by WT1 * MLTCT.

3. If either the peak or off-peak data are to be reviewed separately and AADT values for individual stations are desired, then the specific seasonal data should be isolated and weighted by WT. Annual volumes can be obtained by multiplying by 365.

4. If either the peak or off-peak data are to be reviewed separately, and two or more stations are to be evaluated on an AADT basis, then the specific seasonal data should be isolated and weighted by WT * MLTCT. Annual volumes can be obtained by further multiplying by 365.

4.6 AADT Comparisons

The overall file, when weighted to include the peak and off-peak data, reflects permanent count station AADT values very closely. Table 4.2 has been prepared to compare the expanded AADT estimates with the permanent count station AADT values. When the three notes at the bottom of Table 4.2 are taken into account, it can be stated the expanded AADT values reflect the recorded permanent station AADT values very closely. Thus the file should accurately reflect travel patterns to, from and throughout the Study Area.

TABLE 4.2

COMPARISON OF EXPANDED AADT ESTIMATES
WITH PERMANENT STATION AADT VALUES

Survey Station	Expanded AADT Estimate	Permanent Station AADT[1]
Longs Creek	5,699	6,370[2]
Coles Island	3,881	3,790
Geary	3,402	3,130
Norton	5,686	5,680
Moncton/Riverglade	7,944	7,780[3]

[1] These are 1989 AADT permanent station values.

[2] This value has been recorded at the Longs Creek Bridge. The O-D survey was conducted at the interchange overpass and thus the estimated AADT estimate does not include St. Stephen related traffic. A review of the manual counts suggest the value at this location should be similar to the 5,699 expanded AADT estimate.

[3] This AADT value is at the Riverglade permanent count station. The expanded AADT estimate (7,944) is for the survey station east of Route 112. A check of the temporary count at this location, when adjusted for axle error, indicates the 7,944 value is realistic.

4.7 Comparison With Other Databases

This most recent origin-destination data collection effort has resulted in almost 18,000 roadside interviews of both cars and trucks. The Study Area was primarily comprised of southern New Brunswick and five survey stations.

In 1979, a New Brunswick wide roadside travel survey was conducted of all vehicles, resulting in over 52,000 interviews. Twenty-six survey stations were utilized for data collection. An all truck roadside origin-destination survey was completed in 1984 throughout the Atlantic Region, resulting in approximately 61,000 interviews. In New Brunswick a total of 21 survey stations were employed during this data collection activity.

Efforts by the Department of Transportation over the last few years have been directed at evaluating various routing options for a four lane Trans Canada Highway through New Brunswick. One particular area where recent efforts have been directed is a routing between Fredericton and Moncton. Both the 1979 and 1984 origin-destination databases have been utilized to estimate the traffic volume which would divert to a direct route between Fredericton and Moncton. The 1979 database was used to estimate all vehicles except trucks, while the 1984 database was used to estimate truck volumes. Both databases were expanded to represent 1990 volumes.

These two expanded files indicated that a direct route between Fredericton and Moncton would attract 3,530 vehicles daily, approximately 15 percent of which would be trucks. A more detailed discussion as to how this value was determined is presented in the report entitled *Traffic Evaluation of Alternate TCH Routings* which was prepared for NBDOT in May 1990. Because the databases are between 7 and 12 years old, it was felt more up-to-date data should be gathered to reflect travel patterns to, from and throughout the southern New Brunswick area. Therefore, the 1990/91 origin-destination survey was conducted with the objective of providing up-to-date travel data.

As previously mentioned, the older databases indicated that 3,530 vehicles daily would divert to a direct routing between Fredericton and Moncton. The 1990/91 database indicates this value to be 3,255 vehicles daily, with over 23 percent trucks. This value is based on an origin-destination profile which includes only major stops.

It should be noted that the 1979 travel survey only recorded the overall origin-destination trip profile and did not record the location of intermediate stops. If the 1990/91 overall trip origin-destination trip profile is utilized for passenger vehicles only, while still reflecting major intermediate stops for trucks (ie. to reflect the same characteristics as the utilization of the 1979 and 1984 databases for divertible traffic), the total divertible daily trips to a direct routing between Fredericton and Moncton is 3,350, with approximately 23 percent trucks.

Thus it can be observed that the 3,530 daily vehicles developed from the older databases is comparable with the 3,350 daily vehicles developed from the 1990/91 origin-destination data. The significant change is the increase in trucks from approximately 15 percent to 23 percent.

APPENDIX A

SURVEY PROCEDURES MANUAL

FGA

New Brunswick Department of Transportation
Origin - Destination Traffic Survey
1990-1991

Roadside Interview and Classification Manual

SECTION 1 - GENERAL

1.1 Purpose of Study

The purpose of this traffic study is to determine travel desire patterns throughout southern New Brunswick, along with other pertinent information relating to travel characteristics such as the number and type or classification of vehicles.

The best way to obtain such information is, in part, by directly questioning the drivers of motor vehicles as to:

(a) where they began their trip (TODAY)?
(b) where will they end their trip (TODAY)?
(c) have they or will they make any stops along the way?
(d) for what reason will they or did they stop?
(e) for what purpose are they making this trip?
(f) what routing have they taken or will they take between their origin and destination?

as well as by recording each vehicle by type and direction of travel.

1.2 Study Area

The study area includes the area between Fredericton, Moncton, and Saint John, including Sussex, Chipman and Minto; with the emphasis on Routes 2 (TCH), 7, 10, 1, and 112.

1.3 Interview Stations

For the needs of this study, five (5) roadside interview stations will be setup throughout the study area, each to be surveyed for one day. The locations and the number of hours each station will be operated are as follows:

Roadside Interview and Classification Schedule

Day	Date	Location	Trucks (1)	Cars (2)	All Traffic (3)
Wednesday	07/03	Geary			7:00am-7:00pm
Tuesday	07/09	Longs Creek	7:00am-7:00am	7:00am-7:00pm	
Thursday	07/11	Coles Island			7:00am-7:00pm
Tuesday	07/16	Norton			7:00am-7:00pm
Wednesday	07/17	Moncton	7:00am-7:00am	7:00am-7:00pm	

(1) Times under this heading refer to survey operations at both the Longs Creek truck weigh scales and the Riverglade (Moncton) weigh scales. At these locations two persons will be required to interview trucks in both directions. Also one person will be required to classify all traffic. These two locations will operate for 24 hours.

(2) Times under this heading refer to survey operations at both Longs Creek and Moncton highway sites. Since trucks will be handled at the weigh scales, only cars and other non-commercial vehicles will be stopped. The survey will consist of two teams of four (4) interviewers, and one (1) flagperson each; one for each side of the highway. In addition, one person will be responsible for classifying traffic.

(3) Times under this heading refer to survey operations at Geary, Coles Island, and Norton where all types of traffic will be stopped in both directions. The survey will consist of two teams of five (5) interviewers and one (1) flagperson each; one for each side of the highway. In addition, one person will be responsible for classifying traffic.

SECTION 2 - ORIGIN-DESTINATION INTERVIEW

2.1 Role of the Police Officer

A policeman will be stationed near the front of each interview line, (the front being that end where traffic enters) to direct vehicles approaching the site from the traffic stream to the interviewers. It is important that each interviewer be aware of the officer's actions at all times. When each set of vehicles has been interviewed, the flagperson at the end of the interview line must coordinate with the police officer to get the vehicles safely back into the traffic stream. This may require the police officer stopping traffic at the front of the interview line. The police officer is responsible for deciding which vehicles should be surveyed, with respect to being able to safely interview them on the side of the highway.

2.2 Conduct of the Interview

Interviewers should question the driver directed to them by the police officer and record the required information on the questionnaire form. They should approach the driver in a courteous, businesslike manner and be as brief as possible. An introduction should be given to the effect:

> "Good Morning, my name is _____ „ We are conducting a survey for the New Brunswick Department of Transportation and we would appreciate your time and cooperation in answering a few questions about your trip today."

If the driver is reluctant to answer the questions, he should be assured that the requested information will be kept confidential and will not be used for enforcement of traffic ordinances. Should the driver still refuse to give the information requested, he should be informed that he doesn't have to answer the questions, but will have to wait until the flagperson can safely direct him back into traffic. Upon completing an interview, the interviewer should thank the motorist for his cooperation.

In conducting interviews, speed is desirable, but the interviewer should not sacrifice legibility, accuracy, or completeness for speed. If the information is not recorded correctly for every question, the entire interview may have to be discarded. Complete and accurate information must be obtained or the time spent in getting the interview is wasted for both the interviewer and vehicle occupants.

The interviewer is cautioned not to suggest answers for the driver such as by saying: "Will you be taking the Coles Island cutoff to get to Moncton?".

2.3 The Interview Form

The attached roadside interview form has been designed for recording trip information. The sheet number, interviewer's name, station number, direction of travel, date, and beginning time period are information common to several trips and have been placed near the top of the form. Each interviewer can enter this information on a small supply of blank forms prior to interviewing on their shift. If the recording of this information is done ahead of time , actual interviewing is made easier and time is saved, both for the vehicle operator and the interviewer.

On each sheet, below the "common information", space is provided for seven (7) interviews or trips. The interviewer must record all trip information in the blank spaces provided and must not record any information in the coding boxes below each line of information. These boxes are for office use only.

2.4 COMPLETING THE INTERVIEW FORM

HEADING INFORMATION

Interviewer: Each interviewer should enter his/her name on the space provided. (Initials will suffice)

Sheet No.: Each interviewer should number his/her sheets consecutively: 1,2,3, etc., beginning each day.

Station No.: Enter the appropriate station number in the space provided. These are:

1. Longs Creek
2. Coles Island
3. Geary
4. Norton
5. Moncton
6. Longs Creek (Weigh Scales)
7. Riverglade (Weigh Scales)

Date: Enter the date of operation as year/month/day - "91/07/03", for example, to refer to Wednesday, July 3rd, 1990.

Hour Period Beginning: Interviews will be conducted by hourly periods. The entry for all trips recorded between 10 A.M. and 11 A.M. will be "10", for those recorded between 1 P.M. and 2 P.M. will be "1", etc. Either AM or PM should be crossed out, whichever is NOT applicable.

Travel Direction: The travel direction should be entered in the space provided. The codes are found on the questionnaire form, near the bottom right corner. All stations will use either (1) Eastbound or (2) Westbound except for Geary which will use either (3) Northbound or (4) Southbound. The term Eastbound refers to traffic travelling from the west to the east.

Column 1: Classification (Vehicle Type):

Enter the appropriate code for the vehicle in the space provided. Codes are found on the right side of the questionnaire form under Vehicle Type. Refer to Section 3 for an explanation of vehicle classification.

Column 2: Number of Axles:

Count the number of axles on the vehicle and enter the total in the space provided. The minimum number is (2). In the case of tractor-trailers, count any axle which may or may not be touching the road surface. (Note: A typical motorcycle will have two axles).

Column 3: Number of Occupants:

Count all persons in the vehicle, including the driver and all other passengers, and enter the total in the space provided. The minimum number is one (1) when only the driver is in the vehicle. If there are nine (9) or more than nine occupants (eg. a bus), enter '9'.

NOTE: The answers to questions in columns 1 to 3 should be completed by the interviewer as the vehicle approaches. Answers to the remaining questions, columns 4 through 11 must be obtained from the driver.

TRIPS, ORIGINS AND DESTINATIONS

The definition of a trip in this survey is "*the one-way travel from one point (origin) to another (destination) for a particular purpose*". The origin is defined as "*the point at which travel began today*" and the destination as "*the point at which the trip will eventually end today*".

Examples:

(i) A vehicle leaves Fredericton bound for Moncton and is interviewed at Coles Island. The trip consists of travel from the origin (Fredericton) to the destination (Moncton), regardless of any stops in between.

(ii) A truck driver, interviewed at Coles Island, says he's coming from Nebraska bound for Newfoundland. The origin will NOT be Nebraska as it is unlikely the trip started there today. The driver should be asked where he started this morning and where he will stop for the night.

(iii) A vehicle leaving Fredericton bound for Saint John is stopped for an interview at Geary. The vehicle will be returning to Fredericton later in the day. The trip in this case is between Fredericton (origin) and Saint John (destination). Returning from Saint John to Fredericton is a separate trip and it must be assumed that the vehicle will be interviewed again later on that trip.

NOTE: **THE ORIGIN AND DESTINATION OF A TRIP MUST NOT BE RECORDED AS THE SAME POINT**. For continuous, circuitous trips, the most distant point reached should be recorded as the destination.

Column 4: Origin of Trip:

The origin should be recorded in the space provided, as the name of a city, town or locality if within New Brunswick or the name of a province or state if outside New Brunswick. If the interviewer is not sure of the location of the response, he should ask the driver for more detail and record it as clearly as possible.

Column 5: Destination of Trip:

The destination should be recorded in the space provided, as the name of a city, town or locality if within New Brunswick or the name of a province or state if outside New Brunswick. If the interviewer is not sure of the location of the response, he should ask the driver for more detail and record it as clearly as possible.

NOTE: If either the origin or the destination is the U.S. record the border crossing that was or will be used.

INTERMEDIATE STOPS

An intermediate stop is a temporary stop the vehicle either has made between the origin and the survey station or will make between the survey station and the destination for a particular purpose.

Columns 6 and 8: Intermediate Stops:

Entries for these two inquiries are similar and will be described together. The location of the intermediate stop should be recorded in the space provided. This should be the name of a city, town, or locality within New Brunswick. If a stop was made outside the province , it is not necessary to record it. For example, if a vehicle was surveyed at Coles Island and the driver said he had stopped in Fredericton enroute to Moncton from Woodstock; the intermediate stop is recorded as '*Fredericton*'. A vehicle may have made more than one stop since starting or may make more than one stop between the survey station and the destination. If this is the case, the most important stop should be recorded. That is, the one which causes the driver to be held up the longest or which causes the greatest deviation from his route.

For example:

(i) A truck driver going from Woodstock to Sackville is interviewed at Coles Island. He has already stopped at Fredericton for fuel and will be stopping at Sussex to make a delivery and at Moncton for some lunch. Column 6 would be filled in as '*Fredericton*', with the purpose in Column 7 filled in as '9'. The interviewer now has to decide what to fill in for Columns 8 and 9. In this case, where more than one stop will be made, the more important one - delivery of goods, should be used. Therefore, Column 8 would be filled in as '*Sussex*' and Column 9 would be filled in as '8' (goods movement).

(ii) Assume the same driver will be making a stop in Shediac to visit relatives instead of stopping in Moncton for lunch. In this case the stop in Shediac causes a greater deviation from his normal route than his stop in Sussex, thereby becoming a more important stop. Column 8 should then be filled as '*Shediac*' with the stop purpose in Column 9 filled in as '5'.

Columns 7 and 9: Purpose of Stop:

The purpose of stop should be entered in the space provided as the code number which corresponds to the response. The codes are found at the right of the questionnaire form under Purpose of Stop. They are as follows:

1. **business** (eg. a salesman making a sales stop enroute to his main destination)
2. **work** (eg. a tv news crew looking for a story)
3. **vacation** (eg. a family stopping at Reversing Falls enroute to Fundy)
4. **recreational** (eg. someone stopping at Mactaquac Beach enroute to Moncton)
5. **visit family or friends**
6. **personal** (eg. stop at bank in Sussex enroute to Oromocto)
7. **shopping**
8. **goods drop-off/pick-up** (eg. Midland truck delivering furniture to a store)
9. **food or fuel**
10. **rest stop**
11. **other** (eg. someone was stopped by the police for speeding).

Column 10: Overall Trip Purpose: The overall trip purpose should be recorded as the appropriate code number in the space provided. The codes are located at the right side of the questionnaire form under Overall Trip Purpose.

There are nine (9) possible codes which may be used, which are similar to those under Purpose of Stop.

1. **business** (eg. a businessman making a sales trip)
2. **work** (eg. someone going to or, coming from work)
3. **vacation** (eg. a family enroute to Fundy for two weeks)
4. **recreational** (eg. someone heading to Crabbe Mountain to hang-glide)
5. **visit family or friends**
6. **personal** (eg. doctors appointment)
7. **shopping**
8. **goods movement** (eg. pulp truck hauling logs to Saint John)
11. **other** (eg. bus route). 'Other' is coded here as eleven (11) to correspond with the Purpose of Stop codes.

Column 11: Routing:

For all trips from Moncton or east of Moncton to Fredericton or west of Fredericton, and vice versa, it must be clear which route the vehicle has taken. The possible routes are:

A. Route #2 (TCH) only,
B. Route #2 (TCH and Route #112 (Coles Island Rd.)
C. Routes #10, #116, and #126 (Minto Highway, Salmon River Rd. and Rogersville Highway)

For interview stations #3-Geary, and #4-Norton, it is not necessary to know the route as in most cases the trip will not be between Moncton/Fredericton unless an intermediate stop has influenced it. For example:

(1) A vehicle, interviewed at Geary, going from Saint John to Fredericton would not have taken one of the possible routes, and therefore the routing question should not be asked.

(2) The same vehicle, interviewed at Geary, going from Saint John to Fredericton and then to Moncton will have to take one of the possible routes. The interviewer should find out which route the driver will take in this case, as Fredericton will be considered an intermediate stop influencing the overall trip.

(3) A vehicle stopped at Norton enroute from Saint John to Sussex with no stops will not have to have a route entered as it isn't going between Fredericton/Moncton.

(4) A vehicle interviewed at Coles Island enroute from Sackville to Jemseg with no stops needs to have routing information as the vehicle could have come either through Sussex (Route #2 TCH) or through Route #112 (Coles Island Rd.)

(5) A Tractor-trailer interviewed at Longs Creek has come from N.S. bound for Toronto. It is most likely to have taken Route #2 (TCH) only as trucks are not allowed on Route #112 except for local traffic.

(6) A tractor-trailer interviewed at Riverglade has come from Edmundston bound for Moncton. The interviewer should not ask the driver about routing as it should be clear which route was taken - Route #2 (TCH). This route should be entered in the routing space.

(7) A tractor-trailer interviewed at Riverglade has come from Sussex bound for P.E.I. It is not necessary to enter routing information for this trip as the overall trip does not extend beyond the junction of the Rte #112 and Rte #2 at Coles Island.

For coding purposes, the codes are as follows:

01 - A. Route #2 only.
02 - B. Routes #2 and #112.
03 - C. Routes #10, #116, #126.

The interviewer should familiarize himself with the attached maps of the study area to be able to phrase the routing question to the driver efficiently in order to obtain the desired information.

2.5 Completed Interview Forms

At the end of each hour of the survey shift, the interview forms should be collected by the crew chief, reviewed quickly for accuracy and placed in an envelope with label indicating the survey location, time and date affixed to the front for submission to the office.

2.5 Ending the Interview

When the interviewer has finished with the last question, the interview sheet should be quickly checked for completeness. Once this is done, the interviewer should thank the driver for his time and ask him to proceed to the end of the interview line and wait for the flagperson to direct him safely back into traffic. INTERVIEWERS SHOULD MAKE SURE THAT AS THEY STRAIGHTEN UP AND STEP BACK, NOT TO STEP BACK TOO FAR AS THERE WILL BE TRAFFIC BEHIND THEM.

2.6 Role of the Flagperson

The flagperson will stand at the front of the interview line as indicated in the attached diagram. He/She will be responsible for moving interviewed vehicles safely back into traffic. This will be done by stopping vehicles at the end of the interview line with a stop sign which will be facing the stopped vehicles, and waiting for a break in traffic AND for a signal from the policeman at the other end of the line that it is safe to proceed. Once it is safe to proceed the flagperson should flip the stop sign to the slow sign, step out of the way and wave the drivers into back into the driving lane, always keeping an eye out for any traffic conflicts.

The job of the flagperson should not be taken lightly; it is often the hardest part of the survey. Persons flagging have to be very assertive, very polite, and very alert. It is important that, when stopping vehicles, the stop sign is place in front of the vehicle, on the drivers side, back far enough for the driver to see it. When directing vehicles back into the driving lane, make sure the sign is out of the way. Use **EXAGGERATED ARM** movements to signal - **NOT** finger movements, **NOT** hand movements, **NOT** head movements, **EXAGGERATED ARM** movements. The flagperson will find that most drivers will pay attention and cooperate, but there are always a few that won't.

2.7 General Notes

- All persons on the crew must at all times be courteous, regardless of how those being interviewed act.
- Drivers DO NOT have to answer questions, but they DO have to obey the traffic directions of the policemen and the flagpersons.
- It is very important that the surveys begin on time and run for the full twelve or twenty-four hours each day, as appropriate. Crews must be on site at least 40 minutes before beginning the survey in order to set-up and prepare sheets, etc.
- Interviewers should try to spell place names as accurately or legibly as possible. If a particular name is impossible, they should ask for help.
- Safety equipment must be worn at all times. This equipment is the property of D.O.T. and must be returned at the end of the survey in good condition.

SECTION 3 - CLASSIFICATION COUNT

3.1 Conduct of Survey

The classifiers will be positioned at locations which offer a clear view of the appropriate road section or highway junction, ready to begin surveying at the start of each period. It is important that the survey be continuous and uninterrupted throughout the entire period. Therefore, persons classifying will be relieved occasionally by other members of the crew.

Each vehicle, as it crosses the border, must be recorded on a classification count sheet by vehicle type and direction of travel. (A copy of this sheet is attached). Vehicles include all types of cars, trucks, motorcycles, buses, recreational vehicles (RV's), bicycles, mopeds, all types of special purpose vehicles; basically **any vehicle operating under its own power**. One sheet will be filled in per hour. A description of how to fill in the form follows.

NOTE: IT IS IMPORTANT THAT ALL RECORDING BE DONE AS LEGIBLY AND AS ACCURATELY AS POSSIBLE.

3.2 FILLING IN THE CLASSIFICATION FORM

HEADING INFORMATION

At the top of each form are spaces for the classifier's name, station no., date, time period, and weather. These should be filled in prior to beginning each shift, if possible, as it is difficult to do so and try to classify vehicles at the same time during busy periods

Recorder: The classifier should fill in his/her name in the space provided. (initials will suffice).

Time Period: Fill in the beginning and ending hours of the current survey period. For example, if the shift runs from 7:00am to 7:00pm enter "7AM to 7PM".

Station #: Enter the appropriate station number in the space provided.

1. Longs Creek
2. Coles Island
3. Geary
4. Norton
5. Moncton
6. Longs Creek (Weigh Scales)
7. Riverglade (Weigh Scales)

Date Fill in the date as year/month/day - name of day. i.e. "91/07/03 - Wed" for July 3rd, 1991.

Hour Period Beginning: Enter the appropriate hour of the survey as one number. For example, for the period between 12 P.M. and 1 P.M. enter "12PM"; for the period between 2 P.M. and 3 P.M. enter "2PM".

Weather: Enter a brief, one word description of the overall weather for the survey period.
For example: enter "Sunny" or "Rain".

CLASSIFICATION SECTION

Below the heading information are five blocks of space divided into columns and rows. The first of these, on the left, consists of one column, and contains the vehicle types to be classified. The next four blocks each consist of three columns. Each of the these blocks represent a leg of the intersection where the classification will take place. At the top of each block is a space for route identification. The three columns in each block represent the three

possible traffic flows or turning movements from that leg of the intersection. The column on the far right and the row on the bottom provide spaces for total counts by vehicle type and turning movement respectively. Each sheet is designed to handle the equivalent of a four way intersection:

VEHICLE CLASSIFICATION TALLY SHEET

Recorder: TC
Date: 7/07/12 - WED

Time Period: 7AM - 7PM
Hour Period Beginning: 8AM

Station #: 5 - MON
Weather: SUNNY

Vehicle Type	From Route: 12 - COLES ISD.	From Route: 2 - SUSSEX	From Route: 12 - SALISBURY	From Route: 2 - MONCTON	Total
1. Car/Van/Pick-up					
2. Car/Van/Pick-up with Trailer					
3. Motorcycle					
4. Bus					
5. Single Unit Truck					
6. Single Unit Truck with Trailer					
7. Tractor					
8. Tractor-Trailer					
9. Tractor-Trailer with Trailer					
10. Mobile Home					
11. Recreational Vehicle - RV					
12. Other					
Total					

For two-leg intersections only the centre column of each of two blocks need be used:

VEHICLE CLASSIFICATION TALLY SHEET

Recorder: LH
Date: 7/07/12 - TUE

Time Period: 7AM - 7PM
Hour Period Beginning: 7AM

Station #: 4 - MONCTON
Weather: SUNNY

Vehicle Type	From Route: 1 - SAINT JOHN	From Route: 1 - SUSSEX	From Route:	From Route:	Total
1. Car/Van/Pick-up					
2. Car/Van/Pick-up with Trailer					
3. Motorcycle					
4. Bus					
5. Single Unit Truck					
6. Single Unit Truck with Trailer					
7. Tractor					
8. Tractor-Trailer					
9. Tractor-Trailer with Trailer					
10. Mobile Home					
11. Recreational Vehicle - RV					
12. Other					

For three-leg intersections only two of the three columns of each of three blocks need be used:

VEHICLE CLASSIFICATION TALLY SHEET

Recorder: [illegible] Time Period: 7AM – 7PM Station #: [illegible]
Date: 11/03/03 – WED Hour Period Beginning: 10AM Weather: [illegible]

Vehicle Type	From Route: [illegible]	From Route: [illegible]	From Route: [illegible]	From Route:	Total
1. Car/Van/Pick-up	30 2	25	4 40		[illegible]
2. Car/Van/Pick-up with Trailer	2 1	1	3		3
3. Motorcycle	1				
4. Bus	2				2
5. Single Unit Truck	10 2	4	2 3		[illegible]
6. Single Unit Truck with Trailer	1				[illegible]
7. Tractor	3	1	2		2
8. Tractor - Trailer	12 3	2	3 2		22
9. Tractor - Trailer with Trailer	1				1
10. Mobile Home			1		1
11. Recreational Vehicle - RV	1				6
12. Other			1		1
Total	76 5	39	24 [illegible]		202

From Route: Enter the route number of the highway leg being classified along with an indication of the orientation of the leg. For example, at the junction of Rte 7 and Rte 630, a 'T' intersection, the first two columns of vehicle counts would be labelled From Route: '7 (South)'. The next two columns would be labelled From Route: '630'; and the last From Route: '7 (North)'. The arrows shown in each two column section help to identify which intersection leg belongs in which column. The following are the route numbers which will be used in this survey:

Station #	Location	Route #
1	Longs Creek	2 (only)
2	Coles Island	2 and 112
3	Geary	7 and 660
4	Norton	1 (only)
5	Moncton	2 (only)
6	Longs Creek (Scales)	2 and 3
7	Riverglade (Scales)	2 (only)

Row 1: Car/Van/Pickup: This includes any passenger car, van (cargo van or mini-van), and pick-up truck. Any type of pick-up, four-wheel drive, jeep, pick-up with a camper, panel trucks etc. should be counted under this category.

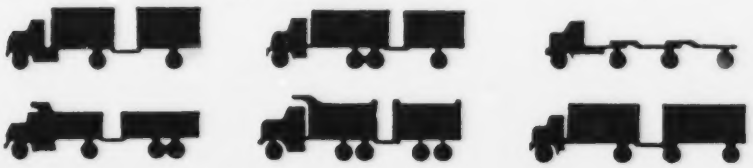
Row 2: Car/Van/Pick-up hauling Trailers: This includes any vehicle type mentioned in Row 1 above that is hauling a trailer of any kind.

Row 3: Motorcycle: This includes all types of motorcycles, all-terrain vehicles, mopeds, etc..

Row 4: Bus: This includes all school buses, coach line buses (SMT, Acadian Lines, etc.), tour buses, transit buses, and any other passenger bus. This should not include a school bus which has been converted to an RV.

Row 5: Single Unit Trucks: This includes all types of single unit trucks - trucks not hauling trailers of any kind - larger than pick-up trucks, panel trucks, 4 by 4's, etc. This category does not include single truck tractors. Common types of single unit trucks are garbage trucks, delivery vehicles, single dump trucks, etc.

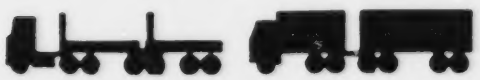
Row 6: Single Unit Truck with Trailer: This includes any truck that would be counted in Row 5, which is hauling a trailer of any kind. This category does not include tractor-trailers. An example is a telephone company truck hauling a trailer with specialized equipment.



Row 7: Truck Tractor: This includes any single truck tractor not hauling a trailer. This category does not include farm tractors, or construction equipment.

Row 8: Tractor-Trailer: This includes all types of tractor-trailer combinations as long as only one trailer is present. Most of these trucks are commercial vehicles used for hauling various commodities, ie. fuel trucks, pulp trucks, general cargo, etc.

Row 9: Tractor-Trailer with Trailer: This includes only those tractor-trailer combinations with more than one trailer. This is not a very common type of truck combination in this area, however, some do exist. Examples include container trucks, some dump trucks, etc.



Row 10: Mobile Homes: This includes only those tractor-trailers which are hauling a mobile home on a flatbed trailer.

Row 11: Recreational Vehicles: This includes all types of larger single unit campers (such as Winnibagoes), as well as any converted bus. This does not include campers carried by pick-up trucks.

Row 12: Other: This includes any vehicle which does not fall into any of the above categories, such as farm tractors, heavy construction vehicles, etc.

Total: Enter the total number of all types of vehicles for the hour as the sum of all the vehicle types in that particular row across the page.

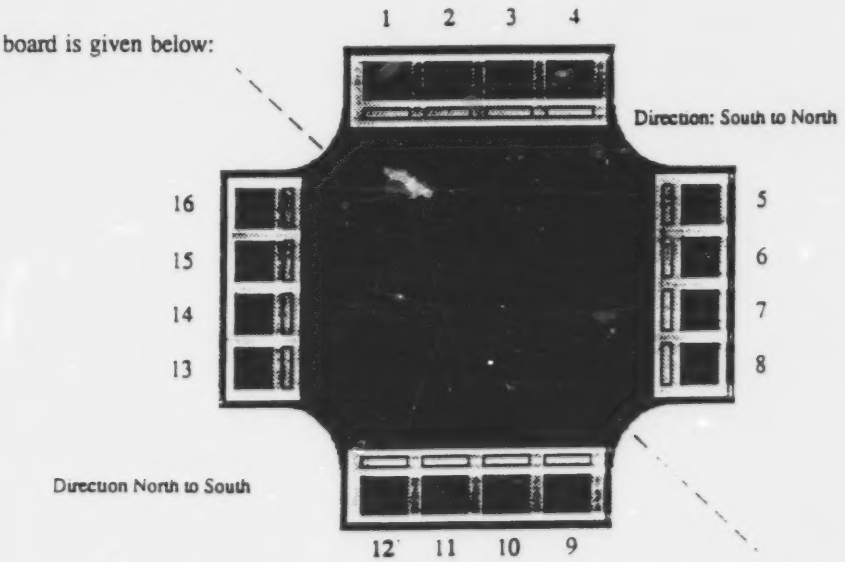
3.3 Counter Board

As a means of facilitating the classifiers job in keeping track of all vehicles moving in all directions, they will be issued counter boards. These are square, clipboard type boards with four counters attached, one on each edge. Each counter has four buttons, which, when pushed, advance their indicators. With four buttons per counter and four counters, it is possible with each board to keep track of up to 16 different combinations of vehicle types and directions.

Since there are twelve vehicle types and up to 12 movements for a total of 144 combinations to record, it is best to use the counters for the most common vehicle types and use small pencil tick marks on the classification sheet for the remaining vehicle types. Three buttons can be used to record the three most common vehicle types for each of the main intersection leg movements, for a total of twelve buttons and the remaining four buttons for the two most common vehicle types travelling from the lower volume leg movements. The most common categories are:

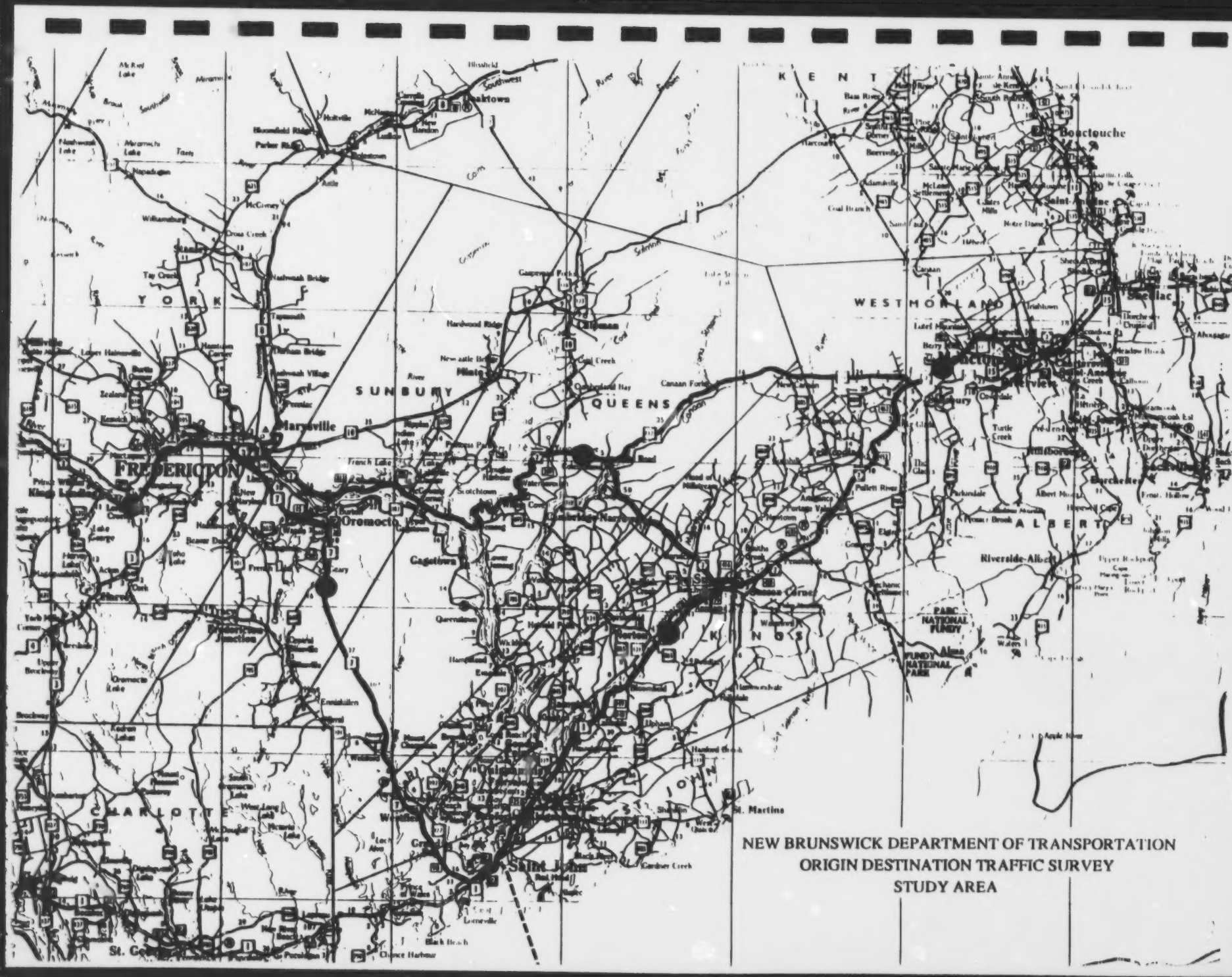
1) passenger cars/vans/pick-ups
2) single unit trucks, and
3) tractor trailers

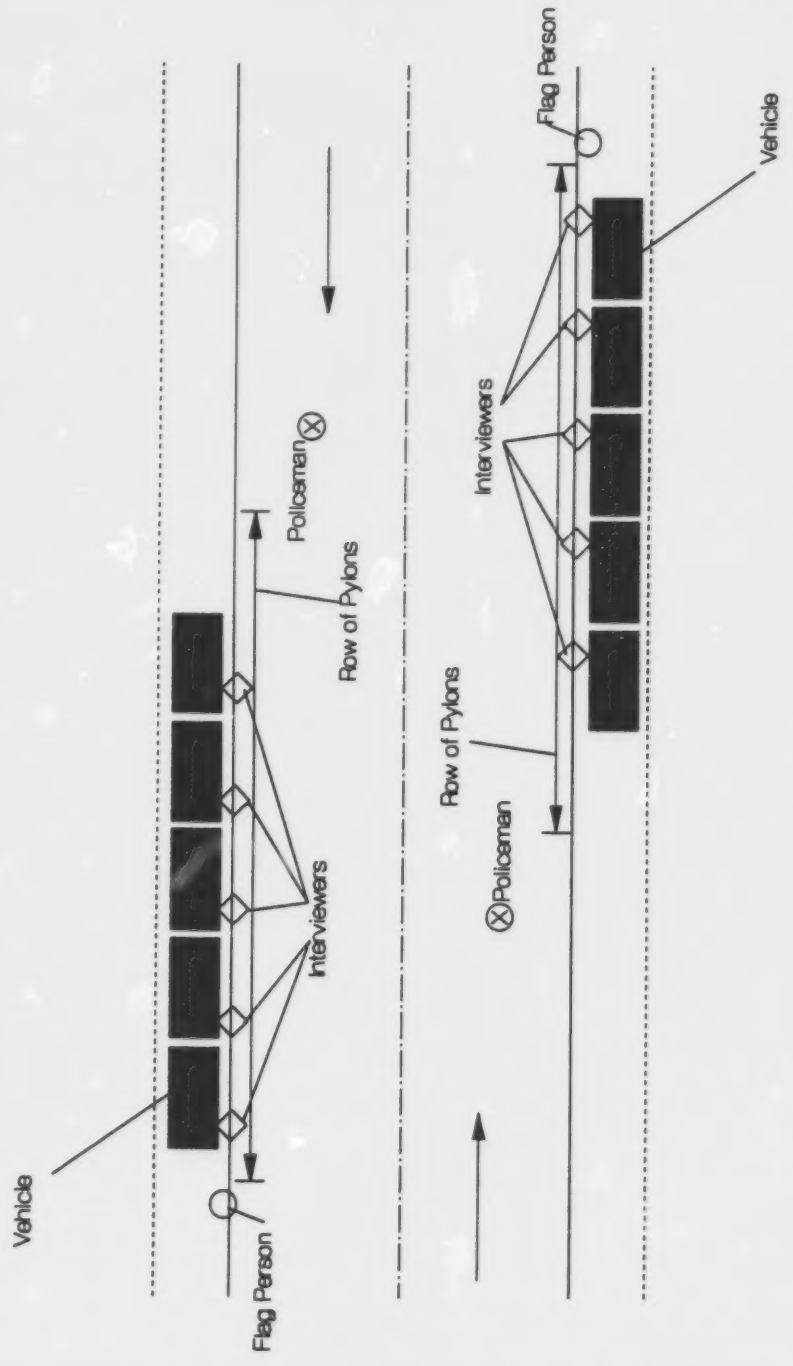
A diagram of a typical counter board is given below:



3.4 Completed Forms

At various times during the day, completed classification forms will be passed on to the crew chief for verification and submission to the office.


KENT
Bouctouche
YORK
WESTMORLAND
SUNBURY
QUEENS
Marysville
FREDERICTON
Oromocto
Gagetown
ALBERT
Riverside-Albert
PARC NATIONAL FUNDY
FUNDY NATIONAL PARK
Alma
KINGS
CHARLOTTE
Saint John
St. Martins
ST. JOHN
NEW BRUNSWICK DEPARTMENT OF TRANSPORTATION
ORIGIN DESTINATION TRAFFIC SURVEY
STUDY AREA



Legend:

Drawing Title: FIGURE 2
STATION SET-UP
FOR APPROACHES WITH WIDE SHOULDERS

Project Title:
FREDERICTON/MONCTON TCH CORRIDOR
O-D TRAFFIC SURVEY ANALYSIS 1990-91

FGA FIANDER-GOOD ASSOCIATES LTD.

Date: 10/1990

Scale:	Drawn By:	Project No:
Not to Scale	JTGB	90-0176

NEW BRUNSWICK DEPARTMENT OF TRANSPORTATION
ORIGIN - DESTINATION SURVEY 1990-1991

Interviewer: _____ Sheet No: _____

Interview Station No: ___ ☐ Travel Direction: ___ ☐ Date: _____ ☐☐☐☐ Hour Period Beginning: _____ AM / PM ☐☐

	Vehicle Data			Origin and Destination		Intermediate Stops				Trip Purpose (Overall)	What Route are you Taking Between your Origin and Destination ?
	Classification Vehicle Type	# of Axles	# of Occupants	Where are you COMING FROM Today ? Town / Province / State	Where are you GOING TO Today ? Town / Province / State	Did you make any Stops since you Started ? Town / Province / State	Purpose of Stop	Will You Make a Stop before you reach your Destination ? Town / Province / State	Purpose of Stop		
	1	2	3	4	5	6	7	8	9	10	11
1											
2											
3											
4											
5											
6											
7											

Vehicle Type:
1. Car/Van/Pick-up
2. Car/Van/Pick-up with Trailer
3. Motorcycle
4. Bus
5. Single Unit Truck
6. Single Unit Truck with Trailer
7. Tractor
8. Tractor-Trailer
9. Tractor-Trailer with Trailer
10. Mobile Home
11. Recreational Vehicle - RV
12. Other

Purpose of Stop:
1. Business
2. Work
3. Vacation
4. Recreational
5. Visit Family or Friends
6. Personal
7. Shopping
8. Goods Drop-off/Pick-up
9. Food / Fuel
10. Rest Stop
11. Other

Overall Trip Purpose:
1. Business
2. Work
3. Vacation
4. Recreational
5. Visit Family or Friends
6. Personal
7. Shopping
8. Goods Movement
11. Other

Travel Direction
1. Eastbound
2. Westbound
3. Northbound
4. Southbound

N. B. DEPT. OF TRANSPORTATION ORIGN-DESTINATION SURVEY
VEHICLE CLASSIFICATION TALLY SHEET

Station #:_____

Time Period:_____

Weather:_____

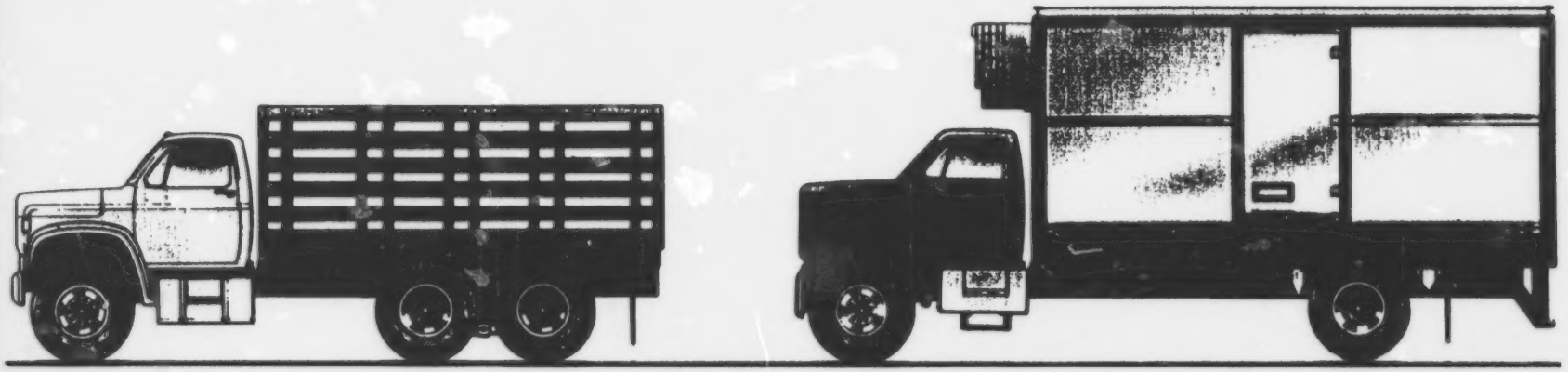
ecorder:_____

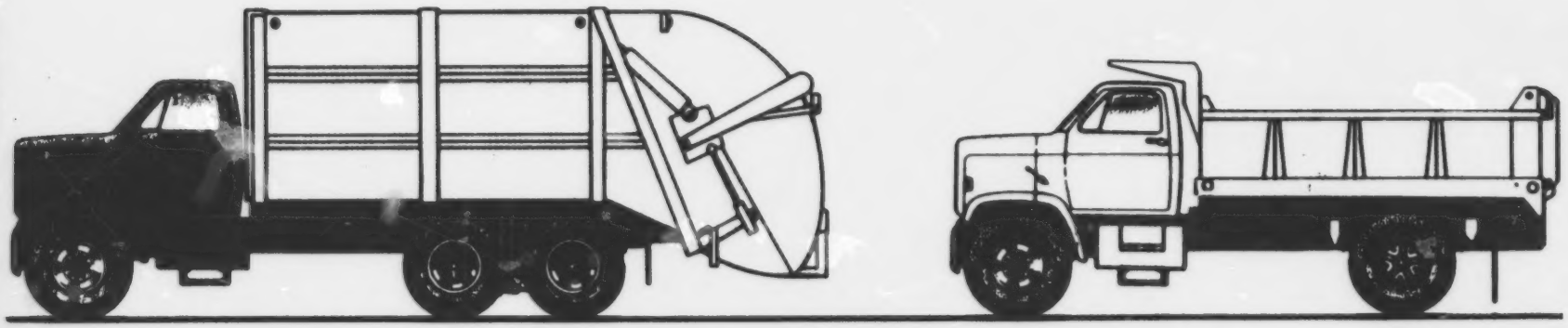
Hour Period Beginning:_____

ate:_____

Vehicle Type	From Route:	From Route:	From Route:	From Route:	Total
1. Car/Van/Pick-up					
2. Car/Van/Pick-up with Trailer					
3. Motorcycle					
4. Bus					
5. Single Unit Truck					
6. Single Unit Truck with Trailer					
7. Tractor					
8. Tractor-Trailer					
9. Tractor-Trailer with Trailer					
10. Mobile Home					
11. Recreational Vehicle - RV					
12. Other					

EXAMPLES OF STRAIGHT TRUCKS





NEW BRUNSWICK DEPARTMENT OF TRANSPORTATION
ORIGIN - DESTINATION SURVEY
1990-1991

SUMMER 1991 SCHEDULE

DATE	SURVEY TIME	LOCATION	SURVEY	CREW REQUIREMENTS
July 3	7:00 am - 7:00 pm	Geary	All Traffic	10 Interviewers 2 Flagpersons 1 Classifier 1 Spare
July 9	7:00 am - 7:00 pm	Longs Creek on TCH	Non-trucks Only	8 Interviewers 2 Flagpersons 1 Classifier
	7:00 am - 7:00 am *(24 hours)* *3 shifts @ 8 hrs ea.*	Longs Creek at weigh scales	Trucks Only	2 Interviewers 1 Classifier
July 11	7:00 am - 7:00 pm	Coles Island	All Traffic	10 Interviewers 2 Flagpersons 1 Classifier 1 Spare
July 16	7:00 am - 7:00 pm	Norton	All Traffic	10 Interviewers 2 Flagpersons 1 Classifier 1 Spare
July 17	7:00 am - 7:00 pm	Moncton	Non-trucks Only	8 Interviewers 2 Flagpersons 1 Classifier
	7:00 am - 7:00 am *(24 hours)* *3 shifts @ 8 hrs ea.*	Moncton at weigh scales *in Riverglade*	Trucks Only	2 Interviewers 1 Classifier

APPENDIX B

CODING MANUAL

FGA

New Brunswick Department of Transportation
Origin - Destination Traffic Survey
1990-1991

Interview Coding and Data Entry Manual

SECTION 1 - GENERAL

1.1 Purpose of Study

The purpose of this traffic study is to determine travel desire patterns throughout southern New Brunswick, along with other pertinent information relating to travel characteristics such as the number and type or classification of vehicles.

The best way to obtain such information is, in part, by directly questioning the drivers of motor vehicles as to:

(a) where they began their trip (TODAY)?
(b) where will they end their trip (TODAY)?
(c) have they or will they make any stops along the way?
(d) for what reason will they or did they stop?
(e) for what purpose are they making this trip?
(f) what routing have they taken or will they take between their origin and destination?

as well as by recording each vehicle by type and direction of travel.

1.2 Study Area

The study area includes the area between Fredericton, Moncton, and Saint John, including Sussex, Chipman and Minto; with the emphasis on Routes 2 (TCH), 7, 10, 1, and 112.

1.3 Interview Stations

For the needs of this study, five (5) roadside interview stations will be setup throughout the study area, each to be surveyed for one day. The locations and the number of hours each station will be operated are as follows:

Roadside Interview and Classification Schedule

Day	Date	Location	Trucks (1)	Cars (2)	All Traffic (3)
Wednesday	07/03	Geary			7:00am-7:00pm
Tuesday	07/09	Longs Creek	7:00am-7:00am	7:00am-7:00pm	
Thursday	07/11	Coles Island			7:00am-7:00pm
Tuesday	07/16	Norton			7:00am-7:00pm
Wednesday	07/17	Moncton	7:00am-7:00am	7:00am-7:00pm	

(1) Times under this heading refer to survey operations at both the Longs Creek truck weigh scales and the Riverglade (Moncton) weigh scales. At these locations two persons will be required to interview trucks in both directions. Also one person will be required to classify all traffic. These two locations will operate for 24 hours.

(2) Times under this heading refer to survey operations at both Longs Creek and Moncton highway sites. Since

trucks will be handled at the weigh scales, only cars and other non-commercial vehicles will be stopped. The survey will consist of two teams of four (4) interviewers, and one (1) flagperson each; one for each side of the highway. In addition, one person will be responsible for classifying traffic.

(3) Times under this heading refer to survey operations at Geary, Coles Island, and Norton where all types of traffic will be stopped in both directions. The survey will consist of two teams of five (5) interviewers and one (1) flagperson each; one for each side of the highway. In addition, one person will be responsible for classifying traffic.

SECTION 2 - ORIGIN-DESTINATION INTERVIEW

2.1 The Interview Form

The attached roadside interview form has been designed for recording trip information. The sheet number, interviewer's name, station number, direction of travel, date, and beginning time period are information common to several trips and have been placed near the top of the form. Each interviewer can enter this information on a small supply of blank forms prior to interviewing on their shift. If the recording of this information is done ahead of time, actual interviewing is made easier and time is saved, both for the vehicle operator and the interviewer.

On each sheet, below the "common information", space is provided for seven (7) interviews or trips. The interviewer must record all trip information in the blank spaces provided and must not record any information in the coding boxes below each line of information. These boxes are for office use only.

The interview forms will be kept in large envelopes, sorted by hour and station with a label attached for identification.

2.2 CODING THE INTERVIEW FORM

HEADING INFORMATION

Although the heading information appears only once on each sheet, each interview must have this entered as part of its record at the data entry step.

Interview Number: Each interview will have a 5-digit identification number associated with it as a control variable. Each interview number is unique. Interviews will be numbered consecutively beginning with the first station, the first hour and ending with the last station, the last hour.

For example, 6013 interviews were carried out in November. The first station was Geary, the first hour 8:00 AM. The first sheet in the hourly envelope contains the interview number '0001'. The envelope for the last survey hour at the last station in Riverglade contains the last interview number '6013'.

The interview number should be marked on the left margin of the interview sheet beside each line. The series of interview numbers in each hourly envelope should be marked on the label side in the top right-hand corner. (Eg. '2511-2703')

Interviewer: Each interviewer will have a 2-digit number associated with their name which the coder will enter beside the Interviewer space at the top of the form. These will be provided on the first day of coding once the field crews are established.

01 - _____	08 - _____
02 - _____	09 - _____
03 - _____	10 - _____
04 - _____	11 - _____

05 - _____ 12 - _____
06 - _____ 13 - _____
07 - _____ 14 - _____

Sheet No.: This number DOES NOT NEED TO BE CODED. This is primarily used to track the work completed on a person by person basis.

Station No.: Enter the appropriate station number in the box provided. These are:

1 - Longs Creek 2 - Coles Island
3 - Geary 4 - Norton
5 - Moncton 6 - Longs Creek (Weigh Scales)
7 - Riverglade (Weigh Scales)

Travel Direction: The travel direction should be entered in the box provided. The codes are found on the questionnaire form, near the bottom right corner. All stations will use either (1) Eastbound or (2) Westbound except for Geary which will use either (3) Northbound or (4) Southbound. The term Eastbound refers to traffic travelling from the west to the east. If the interviewer has obviously entered the wrong travel direction for a particular station, code the box using the correct number.

1 - Eastbound 3 - Northbound
2 - Westbound 4 - Southbound

Date: Code the date of interview as MONTH,DAY - "07/03", for example, refers to Wednesday, July 3rd. This would be coded as '0703' in the boxes provided. The coder should always check to make sure that the correct date has been entered.

Year: Although there is no space for Year on the sheet, this code needs to be entered at the data entry phase. For the summer survey the year will always be '91'.

Hour Period Beginning: Interviews will be conducted by hourly periods. The interviewers' entry for all trips recorded between 10 A.M. and 11 A.M. will be "10", for those recorded between 1 P.M. and 2 P.M. will be "1", etc. Either AM or PM should be crossed out, whichever is NOT applicable.

The code will be entered in 24 hour clock standard - 2:00 P.M. = 1400 hrs., etc. Enter the appropriate 2-digit code in the box provided. Keep in mind that 0 hrs is midnight and refers to interviews conducted between midnight and 1:00 A.M. (coded as '00'). 11:00 P.M. is 2300 hrs and refers to interviews conducted between 11:00 P.M. and 12:00 A.M. (coded as '23'). There is no such time as 2400 hrs.

'00' - 12:00 AM '12' - 12:00 PM
'01' - 1:00 AM '13' - 1:00 PM
'02' - 2:00 AM '14' - 2:00 PM
'03' - 3:00 AM '15' - 3:00 PM
'04' - 4:00 AM '16' - 4:00 PM
'05' - 5:00 AM '17' - 5:00 PM
'06' - 6:00 AM '18' - 6:00 PM
'07' - 7:00 AM '19' - 7:00 PM
'08' - 8:00 AM '20' - 8:00 PM
'09' - 9:00 AM '21' - 9:00 PM
'10' - 10:00 AM '22' - 10:00 PM
'11' - 11:00 AM '23' - 11:00 PM

Column 1: Classification (Vehicle Type):

Enter the appropriate code for the vehicle in the box provided. The code should be the same as what the interviewer has entered in the space.

Column 2: Number of Axles:

Enter the appropriate number in the box provided. The number should be the same as what the interviewer has entered. Keep in mind that the minimum number is always '2'. (Note: A typical motorcycle will have two axles).

Column 3: Number of Occupants:

Enter the appropriate number in the box provided. The number should be the same as what the interviewer has entered. Keep in mind that the minimum number is '1' and that the maximum number should be '9'. If the interviewer has entered a number greater than '9', code the box with a '9'. This will usually only happen if the vehicle is a bus.

TRIPS, ORIGINS AND DESTINATIONS

The definition of a trip in this survey is "*the one-way travel from one point (origin) to another (destination) for a particular purpose*". The origin is defined as "*the point at which travel began today*" and the destination as "*the point at which the trip will eventually end today*".

Examples:

(i) A vehicle leaves Fredericton bound for Moncton and is interviewed at Coles Island. The trip consists of travel from the origin (Fredericton) to the destination (Moncton), regardless of any stops in between.

(ii) A truck driver, interviewed at Coles Island, says he's coming from Nebraska bound for Newfoundland. The origin will NOT be Nebraska as it is unlikely the trip started there today. The driver should be asked where he started this morning and where he will stop for the night.

(iii) A vehicle leaving Fredericton bound for Saint John is stopped for an interview at Geary. The vehicle will be returning to Fredericton later in the day. The trip in this case is between Fredericton (origin) and Saint John (destination). Returning from Saint John to Fredericton is a separate trip and it must be assumed that the vehicle will be interviewed again later on that trip.

NOTE: **THE ORIGIN AND DESTINATION OF A TRIP SHOULD NOT BE RECORDED AS THE SAME POINT**. For continuous, circuitous trips, the most distant point reached should be recorded as the destination. It may happen however, that the origin and destination entered are the same. This should only happen if the trip is very local and the place name used refers to a general area.

Column 4: Origin of Trip:

The origin should be recorded in the box provided, as the 5 digit number corresponding to a place name of a city, town or locality if within New Brunswick or the name of a province or state if outside New Brunswick. The code numbers can be found in the section of this manual marked 'Alphabetical Code List'. If the name can't be found in the alphabetical listing, check the copy of the New Brunswick gazetteer to locate the name on a map of the province. Once found, look up the code number of the nearest place name to the actual origin and enter that number in the boxes provided. Sometimes the origin may be a road name or place name local to the area around the interview station. The station location can be used to help find an origin.

A lot of times, the name entered by the interviewer may be a common enough, well known place name, but is either written incoherently or spelled so badly as to give the person coding some problems. If the origin name entered cannot be coded in a reasonable amount of time, code the entry as '99999', make a note of the interview number, and the response on a separate piece of paper.

Column 5: Destination of Trip:

The destination should be recorded in the boxes provided, in the same manner as the origin above. The logic used to code a destination is the same as that used to code an origin.

INTERMEDIATE STOPS

An intermediate stop is a temporary stop the vehicle either has made between the origin and the survey station or will make between the survey station and the destination for a particular purpose.

Columns 6 and 8: Intermediate Stops:

Entries for these two inquiries are similar and will be described together. The location of the intermediate stop should be coded in the boxes provided in the same manner as the origin and destination. The process described above to find the origin also applies to the Intermediate stop locations. There shouldn't be any Intermediate stops outside of New Brunswick. If, however, the interviewer has entered a location outside of the province, code as such. If the interviewer has indicated that multiple stops were or will be made, DO NOT CODE THESE RESPONSES.

Columns 7 and 9: Purpose of Stop:

The purpose of stop should be coded in the boxes provided as the 2 digit code number which corresponds to the response. The codes are found at the right of the questionnaire form under Purpose of Stop. They are as follows:

01 - business (eg. a salesman making a sales stop enroute to his main destination)
02 - work (eg. a tv news crew looking for a story)
03 - vacation (eg. a family stopping at Reversing Falls enroute to Fundy)
04 - recreational (eg. someone stopping at Mactaquac Beach enroute to Moncton)
05 - visit family or friends
06 - personal (eg. stop at bank in Sussex enroute to Oromocto)
07 - shopping
08 - goods drop-off/pick-up (eg. Midland truck delivering furniture to a store)
09 - food or fuel
10 - rest stop
11 - other (eg. someone was stopped by the police for speeding).

Column 10: Overall Trip Purpose:

The overall trip purpose should be recorded as the appropriate 2 digit code number in the boxes provided. The codes are located at the right side of the questionnaire form under Overall Trip Purpose. There are nine (9) possible codes which may be used, which are similar to those under Purpose of Stop.

01 - business (eg. a businessman making a sales trip)
02 - work (eg. someone going to or, coming from work)
03 - vacation (eg. a family enroute to Fundy for two weeks)
04 - recreational (eg. someone heading to Crabbe Mountain to hang-glide)
05 - visit family or friends

06 - personal (eg. doctors appointment)
07 - shopping
08 - goods movement (eg. pulp truck hauling logs to Saint John)
11 - other (eg. bus route). 'Other' is coded here as eleven (11) to correspond with the Purpose of Stop codes.

Column 11(a): Routing:

For all trips from Moncton or east of Moncton to Fredericton or west of Fredericton, and vice versa, it must be clear which route the vehicle has taken. The possible routes are:

A. Route #2 (TCH) only,
B. Route #2 (TCH and Route #112 (Coles Island Rd.)
C. Routes #10, #116, and #126 (Minto Highway, Salmon River Rd. and Rogersville Highway)

For interview stations #3-Geary, and #4-Norton, it is not necessary to know the route as in most cases the trip will not be between Moncton/Fredericton unless an intermediate stop has influenced it. For example:

(1) A vehicle, interviewed at Geary, going from Saint John to Fredericton would not have taken one of the possible routes, and therefore the routing question should not be asked.

(2) The same vehicle, interviewed at Geary, going from Saint John to Fredericton and then to Moncton will have to take one of the possible routes. The interviewer should find out which route the driver will take in this case, as Fredericton will be considered an intermediate stop influencing the overall trip.

(3) A vehicle stopped at Norton enroute from Saint John to Sussex with no stops will not have to have a route entered as it isn't going between Fredericton/Moncton.

(4) A vehicle interviewed at Coles Island enroute from Sackville to Jemseg with no stops needs to have routing information as the vehicle could have come either through Sussex (Route #2 TCH) or through Route #112 (Coles Island Rd.)

(5) A Tractor-trailer interviewed at Longs Creek has come from N.S. bound for Toronto. It is most likely to have taken Route #2 (TCH) only as trucks are not allowed on Route #112 except for local traffic.

(6) A tractor-trailer interviewed at Riverglade has come from Edmundston bound for Moncton. The interviewer should not ask the driver about routing as it should be clear which route was taken - Route #2 (TCH). This route should be entered in the routing space.

(7) A tractor-trailer interviewed at Riverglade has come from Sussex bound for P.E.I. It is not necessary to enter routing information for this trip as the overall trip does not extend beyond the junction of the Rte #112 and Rte #2 at Coles Island.

For coding purposes, the codes are as follows:

01 - A. Route #2 only.
02 - B. Routes #2 and #112.
03 - C. Routes #10, #116, #126.

The coder should familiarize himself with the attached maps of the study area in order to assess the logic of the response.

Column 11(b): Multi-count factor:

In the smaller of the two boxes provided under routing enter the appropriate multicount factor for the trip. This number will usually be a 1, 2, or a 3. It represents the theoretical amount of interview stations a vehicle would pass through if all stations were operating at the same time. To determine this number:

1. Locate the origin and destination of the trip on the survey station map.
2. Following the route taken by the vehicle, count the number of stations it would have passed through had all stations been in operation at the time of the trip.
3. Remember to consider any intermediate stops when counting the number of stations.

For example, a trip from Woodstock to Moncton would have passed through stations at Longs Creek, Coles Island, and Moncton before arriving at its destination. The multi-count factor is three and would be entered as '3' in the box. The same trip from Woodstock to Moncton, with an intermediate stop in Saint John would pass through four stations before arriving at its destination. The multi-count factor would be four for this trip and would be entered as '4'.

For the most part, these are fairly simple calculations. Two important considerations are as follows:

(1) This concerns trips that have the U.S.A. as either an origin or a destination. For these trips, note the border crossing used to determine more precisely the routing taken. If the interviewer hasn't recorded the border crossing, assume it to be Houlton/Woodstock.

(2) For trips Originating or Destined to areas where Route 3 would be used south of Longs Creek (this would include places such as Harvey, McAdam, St. Stephen, St. Andrews, Campobello, Deer Island, Grand Manan, and St. George) and Destined to or Originating from West or East of Longs Creek, the vehicle type must be checked to see whether the Longs Creek survey station would be counted. This station would only be counted if the vehicle were a truck (and would therefore have to use the weigh scales). If the vehicle was a car or bus or RV, it would not necessarily have been surveyed.

2.2 General Notes

(i) All coding is to be done using a **red** pencil or pen.

(ii) Before coding a trip, read the whole line to make sure it makes sense. If it doesn't, record what's wrong on a separate piece of paper along with the interview number.

(iii) Code the interview numbers on all the sheets for a particular station before coding anything else. Once all the sheets are coded for a station, check to make sure that all the interviews have been assigned numbers. This is VERY important as missed interviews cause a great deal of trouble down the road.

(iv) Always keep the interview sheets in their hourly envelopes and remember to record the series of interview numbers on the label side of the envelope in the upper right-hand corner.

(v) Each coder that codes an envelope should write their initials on the label side under the interview number series.

(vi) Once the coding of each envelope is finished, it should be checked quickly for accuracy by another coder to make sure that nothing has been missed.

SECTION 3 - DATA ENTRY

Due to various time constraints, the data capture (keying data into the computer) must take place at the same time as the coding. One person will be responsible for this with the remaining persons coding at any one time.

3.1 SPSS Data Entry Software

SPSS (Statistical Package for Social Sciences) is software package which will be used to capture and analyze the data from the survey. A very powerful software package, one of its main features is an add-in called SPSS-Data Entry which allows the user to enter data from the keyboard in a user-friendly screen environment. For the purposes of the project a data entry screen has been designed to facilitate the process on an interview by interview basis. SPSS Data Entry is a menu driven program that is divided into various branches (Files, Forms, Cleaning, etc.). It makes use of the 'SHIFT', 'CTRL', and 'ALT' keys to move from branch to branch and to select activities. This manual will give a quick overview of instructions on how to begin and end a data entry session.

3.2 Starting from Scratch

To begin, SPSS is found on the hard drive of the computer and can be accessed through a menu system. Before starting the program the users name must be typed in as well as a project #. A main menu will then appear containing 'SPSS'. Choosing this results in a sub-menu listing 'SPSS Data Entry'. Upon selection of this, the program starts.

The steps involved are as follows:

(1) Turn the machine on.
(2) When the logo appears, hit Enter.
(3) Enter your name when prompted (initials will suffice)
(4) Enter the project number as '**527-34**'
(5) From the main menu choose 'SPSS' by using the arrow keys to highlight it and pressing Enter.
(6) From the sub-menu that appears choose 'SPSS Data-Entry II'. This begins the program.

Your now ready to begin work.

The remainder of the SPSS Data Entry instructions are found in the following Section 3.3 - Entering Data Using SPSS Data Entry II.

The data file you will be using is called NBODS.SYS and is found on G:\52734. This means that it is on the G: partition of the hard drive in a subdirectory called \52734. The full filename should always be '**G:\52734\NBODS.SYS**'.

APPENDIX A
ALPHABETICAL CODE LISTING

Loc Code	Location	Zone Code
3441	ACADIEVILLE	328
3713	ACAMAC	322
3499	ADAM	339
3723	ADAMSVILLE	327
3574	ALBERT	323
3010	ALBERT EAST	323
3135	ALLANDALE	311
3320	ALLARDVILLE	334
3321	ALLARDVILLE NORTH	334
3502	ALMA	323
3432	AMOS	331
3212	ANAGANCE	320
3155	ANDOVER	305
3748	ANTERVILLE	300
3525	ANTHONY'S COVE	322
3206	APOHAQUI	320
3486	ARGOSY	303
3156	AROOSTOCK JUNCTION	303
3538	ARTHURETTE	305
3415	ASTLE	308
3354	ATHOLVILLE	338
3233	AULAC	324
3403	BABBIT	319
3523	BACK BAY	317
3258	BAGDHAD	318
3240	BAIE VERTE	324
3556	BAIE ST. ANNE	324
3585	BAKER LAKE	301
3767	BALMORAL	338
3608	BARACHOIS	324
3749	BARBOUR PASSAGE	300
3598	BARKERS POINT	312
3745	BARNESVILLE	319
3426	BARNETT'S	330
3132	BARONY	311
3302	BARRYVILLE	333
3300	BARTIBOG	333
3316	BARTIBOG RIVER	333
3667	BARTLETT MILLS	316
3322	BASS RIVER	336
3266	BATEMAN'S	325
3149	BATH	306
3324	BATHURST	336
3027	BATHURST BELLEDUNE	336
3572	BAY DU VIN	329
3108	BAYARD STATION	319
3246	BAYFIELD	324
3173	BAYSIDE	316
3609	BEAVER HARBOUR	317
3656	BEDDECK	300
3335	BELLEDUNE RIVER	336
3161	BELLEFLEUR	302
3611	BELLEISLE	321
3611	BELLEISLE CREEK	321
3341	BENJAMIN RIVER	337
3327	BERESFORD	336
3460	BERRY MILLS	325
3734	BERTRAND	335
3264	BERWICK	320
3179	BETHEL	317
3485	BEVERIDGE	305
3286	BIG ALDOUANE	328
3451	BIG COVE	326
3376	BLACK BROOK	340
3343	BLACK LANDS	337
3339	BLACK POINT	337
3292	BLACK RIVER	329
3610	BLACK BAY	322
3183	BLACK'S HARBOUR	317
3425	BLACKVILLE	330
3801	BLANCHARD SETTLEMENT	335
3421	BLISSFIELD	330
3614	BLISSVILLE	315
3203	BLOOMFIELD	321
3416	BOIESTOWN	330
3665	BONNY RIVER	317
3216	BOUNDRY CREEK	325
3310	BRANTVILLE	333
3271	BREAU VILLAGE	326
3494	BRENTON	307
3468	BRIDGE DALE	323
3148	BRISTOL	306
3005	BROAD ROAD	322
3453	BROOKVALE	318
3805	BROWN RIDGE	315
3385	BROWNS FLATS	319
3647	BROWNVILLE	321
3430	BRYENTON STATION	331
3022	BUCTOUCHE	326
3140	BULL'S CREEK	307
3129	BURDEN	313
3733	BURNSVILLE	335
3304	BURNT CHURCH	333
3478	BURTON	315
3436	BURTTS CORNER	309
3786	BUSHVILLE	333
3365	C.C. SIDING	339
3798	CAISSE CAPE	326
3587	CALF SETTLEMENT	300
3736	CALHOWN	325

Loc Code	Location	Zone Code
3150	BEECHWOOD	306
3452	BEERSVILLE	326
3332	BELLEDUNE	336
3434	CAMBRIDGE	321
3111	CAMP PETERSON	319
3353	CAMPBELLTON	338
3028	CAMPBELLTON DALHOUSIE	338
3550	CAMPOBELLO	317
3442	CANAAN	320
3570	CANTERBURY	311
3524	CAP PELE (CAPE BALD)	324
3247	CAPE TORMENTINE	324
3524	CAPE BALD (CAP PELE)	324
3512	CARAQUET	335
3025	CARAQUET ISLANDS	335
3019	CARLETON EAST	306
3018	CARLETON WEST	306
3379	CARON	340
3419	CARROLL'S ROAD	330
3794	CASTALIA	317
3637	CEDAR COVE	317
3507	CENTERVILLE	306
3387	CENTRAL GREENWICH	319
3393	CENTRAL HAMPSTEAD	319
3020	CENTRE	330
3797	CHALEUR PARK (DALHOUSI	337
3175	CHAMCOOK	316
3618	CHANCE HARBOUR	322
3644	CHARACTERSVILLE	325
3996	CHARLO	337
3344	CHARLO	337
3002	CHARLOTTE	316
3294	CHATHAM	333
3024	CHATHAM NEWCASTLE	333
3021	CHIPMAN	318
3356	CHRISTOPHER	338
3591	CLAIR	301
3706	CLARENOON	319
3455	CLIFTON	335
3255	COAL CREEK	318
3792	COBURN	313
3270	COCAGNE	326
3551	CODYS	321
3463	COLDBROOK	322
3660	COLDSTREAM	307
3260	COLE'S ISLAND, QUEENS CO.	321
3232	COLES ISLAND, WEST. CO	324
3648	COLESON COVE	322
3323	EAST BATHURST	336
3147	EAST FLORENCEVILLE	306
3226	COLLEGE BRIDGE	324
3612	COLLETTE	329
3265	COOK'S BROOK	325
3754	CORK STATION	313
3380	COTE	303
3802	COTEAU ROAD	335
3307	COVEDELL	333
3558	COVERDALE	325
3345	CREIGS	337
3717	CROSS CREEK	308
3185	CROW HARBOUR	317
3336	CULLIGAN	337
3257	CUMBERLAND BAY	318
3479	CURRIE	305
3433	CURTIS CORNER	331
3790	CURTIS PARK	333
3493	CYR JUNCTION	302
3774	D. CROSSING	300
3347	DALHOUSIE	337
3349	DALHOUSIE JUNCTION	338
3674	DARLINGTON	337
3319	DAULNAY	334
3580	DAVIDSON LAKE	312
3429	DAVIDSON'S	331
3358	DAWSONVILLE	338
3582	DEBEC	307
3495	DEEP CREEK	307
3521	DEER ISLAND	317
3816	DEERSDALE	309
3272	DEPRES ROAD	326
3623	DERBY	331
3204	DICKIE MOUNTAIN	321
3340	DICKLES	337
3220	DIEPPE	325
3178	DIGDEGUASH	316
3619	DIPPER HARBOUR	322
3420	DOAKTOWN	330
3229	DORCHESTER	324
3535	DOUGLAS	309
3296	DOUGLASTOWN	333
3223	DOVER ROAD	325
3588	DRUMMOND	303
3399	DUCK CREEK	319
3796	DUGANVILLE	300
3131	DUMFRIES	311
3763	DUNDEE	338
3470	DUPUIS CORNER	324
3410	DURHAM VILLAGE	312
3361	GLENWOOD, RESTIGOUCHE	339
3766	GLOUCESTER	336

Loc Code	Location	Zone Code
3281	EAST GALLOWAY	328
3476	EAST HAMPTON	321
3169	EDUMUNDSTON	301
3346	EEL RIVER BAR	337
3640	EEL RIVER CROSSING	337
3528	ELGIN	323
3330	ELM TREE	336
3664	ELMSVILLE	316
3206	ERB SETTLEMENT	320
3444	ESCUMINAC	329
3317	ESKEDELLOC STREAM	334
3390	EVANDALE	319
3566	EVANGELINE	324
3744	FAIRFIELD	322
3519	FAIRVALE	320
3462	FAWCETT HILL	325
3297	FERRY ROAD	333
3372	FIVE FINGERS	340
3211	FIVE POINTS	320
3592	FLATLANDS	338
3575	FLORENCEVILLE	306
3810	FLUME RIDGE	316
3568	FOREST CITY	311
3012	FOREST HILL	325
3450	FOSTERVILLE	311
3157	FOUR FALLS	303
3759	FOUR ROADS	335
3110	FOWLERS CORNER	319
3222	FOX CREEK	325
3016	FREDERICTON	312
3435	FREDERICTON JUNCTION	315
3998	FREDERICTON YFC	312
3126	FRENCH VILLAGE	312
3230	FROSTY HOLLOW	324
3001	FUNDY ISLANDS	317
3009	FUNDY PARK	323
3645	GAFTON	307
3397	GAGETOWN	319
3396	GAGETOWN ROAD	319
3282	GALLOWAY HILL	328
3114	GEARY FORKS	315
3267	GILBERT'S CORNER	325
3172	GILLMAN'S CORNER	316
3743	GLADES	325
3510	GLEN FALLS	322
3602	GLENCOE	338
3357	GLENLEVIT	338
3386	GLENWOOD, KINGS CO.	319
3534	HOPEWELL CAPE	323
3559	HOPEWELL HILL	323
3518	GONDOLA POINT	321
3119	GOODINE	315
3795	GORDONSVILLE	317
3724	GOSHEN	323
3103	GRAND BAY	319
3160	GRAND FALLS	303
3015	GRAND LAKE	318
3448	GRAND MANAAN	317
3634	GRAND HARBOUR	317
3613	GRAND-DIGUE	326
3720	GRANDANSE	335
3732	GRANDSAULT	303
3167	GREEN RIVER	302
3482	GREEN ROAD	307
3331	GREEN POINT (POINTE VERT	336
3384	GREENWICH HILL	319
3363	GROG BROOK SHED	339
3364	GROG BROOK DAM	339
3530	GUNNINGSVILLE	325
3400	GUNTERS	319
3498	HALE	307
3189	HALL'S LAKE SIDING	322
3375	HAMMOND BROOK	340
3197	HAMMOND RIVER	321
3392	HAMPSTEAD	319
3201	HAMPTION VILLAGE	321
3007	HAMPTON	321
3200	HAMPTON STATION	321
3115	HANEYTOWN	315
3621	HANWELL	312
3533	HARCOURT	327
3374	HARDINE BROOK	340
3517	HARDINGS POINT	322
3251	HARDWOOD RIDGE	314
3243	HARDYS	324
3144	HARTLAND	307
3545	HARVEY	313
3514	HATFIELD	321
3573	HAVELOCK	320
3133	HAWKSHAW	311
3719	HEATHSTEEL	332
3707	HEWITT	316
3469	HIGHVIEW	300
3464	HILDEGARDE	325
3532	HILLSBOROUGH	323
3715	HILLTOWN	300
3334	HODGSON	336
3757	HOLMESVILLE	306
3315	LITTLE BARTIBOG	333
3274	LITTLE RIVER	326

Loc Code	Location	Zone Code
3776	HOPPER SETTLEMENT	323
3537	HOWARD	330
3599	HOYT	315
3252	HUMPHREY'S CORNER	318
3632	INGALLS HEAD	317
3540	INGLESIDE	319
3472	IRISHTOWN	325
3492	IRON BEN COVE	318
3278	IRVINGDALE ROAD	326
3124	ISLAND VIEW	312
3804	JANEVILLE	335
3337	JAQUET RIVER	337
3544	JEMSEG	319
3238	JOLICURE ROAD	324
3217	JONES	325
3586	JUNIPER	306
3369	KEDGWICK	340
3511	KENNEBECASIS PARK	321
3615	KENT JUNCTION	327
3500	KESWICK	310
3725	KETEPEC	300
3263	KIERSTEAD MOUNTAIN	320
3153	KILBURN	305
3768	KINGS CO.	320
3760	KINGS LANDING	313
3127	KINGSCLEAR	312
3516	KINGSTON	321
3023	KOUCHIBOUGUAC	328
3475	KOUCHIBOUGUAC NTL PAR	328
3563	LAGACEVILLE	333
3577	LAKE GEORGE	313
3589	LAKE UTOPIA	317
3527	LAKEBURN	325
3199	LAKESIDE	321
3289	LAKETON	328
3541	LAKEVILLE CORNER	314
3716	LAMEQUE	335
3371	LAUVRIERE	340
3454	LAVILLETTE	333
3188	LEPREAU	317
3112	LEWISVILLE, QUEENS CO.	319
3520	LEWISVILLE, WESTMLND CO.	325
3484	LICFORD	305
3159	LIMESTONE SIDING	303
3120	LINCOLN CROSSING	315
3105	LINGLEY	319
3701	LISFORD	300
3285	LITTLE ALDOUANE	328
3708	MELLVILLE	300
3244	MELROSE	324
3814	LITTLE CAPE	324
3806	LITTLE LAKE CORNER	315
3508	LOCH LOMAND	322
3438	LOGGIEVILLE	333
3714	LONDONBERRY	320
3262	LONG CREEK, QUEENS CO.	321
3158	LONG SWAMP	303
3128	LONGS CREEK, YORK CO.	312
3789	LORNE	337
3176	LOWER BOCABEC	316
3404	LOWER BURTON	315
3117	LOWER LINCLON	315
3299	LOWER NEWCASTLE	333
3202	LOWER NORTON	321
3006	LOWER RIVER	315
3437	LOWER ST. MARY'S	312
3669	LOWER HAINSVILLE	310
3264	LOWER MILLSTREAM	320
3417	LUDLOW	330
3509	LUTES MOUNTAIN	325
3547	MACADAM	311
3658	MACDONALD'S POINT	321
3581	MACTAQUAC	312
3032	MADAWASKA EAST	301
3031	MADAWASKA WEST	302
3509	MAGNETIC HILL	325
3579	MAGUNDY	313
3779	MAISONETTE	335
3245	MALDEN	324
3583	MALISEET	305
3668	MALPECK	300
3367	MANN SIDING	339
3408	MANNERS	312
3350	MAPLE GREEN	338
3466	MAPLETON (MAPLE WOOD)	310
3808	MARRTOWN	320
3489	MARTIN	302
3490	MARTIN SIDING	302
3791	MARTINON	322
3406	MARYSVILLE	312
3536	MAUGERVILLE	314
3125	MCGINLEYS	312
3414	MCGIVNEY	308
3351	MCLEOD'S	338
3418	MCNAMEE ROAD	330
3389	MCPHERSON	319
3210	MECHANIC SETTLMNT RD	320
3139	MEDUCTIC	311
3811	NEW IRELAND	323
3672	NEW MARYLAND	313

Loc Code	Location	Zone Code
3225	MEMRAMCOOK	324
3224	MEMRAMCOOK WEST	324
3398	MILL BRIDGE	319
3606	MILL COVE	318
3298	MILLBANK	333
3813	MILLBROOK	321
3431	MILLERTON	331
3362	MILLERVILLE	339
3769	MILLIDGEVILLE	322
3730	MILLSBORO	300
3562	MILLTOWN	316
3546	MILLVILLE	310
3249	MINTO	314
3765	MIRAMICHI	329
3026	MIRAMICHI ROAD	329
3473	MISCOU	335
3196	MODEL FARM	321
3012	MONCTON	325
3999	MONCTON YQM	325
3548	MOORES MILLS	316
3710	MORRILL	303
3382	MORRISDALE	319
3029	MOUNT CARLETON PARK	339
3718	MULGRAVE	300
3152	MUNIAC	305
3770	MURRAY CORNER	324
3190	MUSQUASH	322
3543	NACKAWIC	310
3445	NAPADOGAN	309
3134	NAPERVILLE	311
3293	NAPPAN	329
3617	NARROWS	321
3412	NASHWAAK BRIDGE	312
3409	NASHWAAK VILLAGE	312
3506	NASHWAAKSIS	312
3338	NASK CREEK	337
3198	NAUWIGEWAUK	321
3306	NEGUAC	333
3762	NEGUSE	300
3596	NELSON	329
3107	NEREPIS	319
3118	NEVERS ROAD	315
3000	NEW BRUNSWICK	300
3303	NEW JERSEY	333
3342	NEW MILLS	337
3342	NEW MILLS	337
3187	NEW RIVER	317
3567	NEW DENMARK	303
3130	PRINCE WILLIAM	313
3578	PRINCESS PARK	318
3481	NEWBURG	307
3295	NEWCASTLE	333
3250	NEWCASTLE BRIDGE	318
3328	NIGADOO	336
3633	NORTH HEAD	317
3771	NORTH RIVER	325
3204	NORTON	321
3604	NOTRE DAME	326
3171	OAK BAY	316
3388	OAK POINT	319
3564	OAK HILL	316
3366	OLIVER SIDING	339
3116	OROMOCTO	315
3003	OROMOCTO LAKE	313
3497	ORTONVILLE	303
3737	PAQUETTEVILLE	335
3203	PASSEKEAG	321
3145	PEEL	306
3184	PENNFIELD AIRPORT	317
3182	PENNFIELD CORNER	317
3407	PENNIAC BRIDGE	312
3209	PENOBSQUIS	320
3154	PERTH	305
3326	PETERS RIVER	336
3646	PETERS HILL	300
3111	PETERSVILLE	319
3329	PETIT ROCHER	336
3013	PETITCODIAC	325
3504	PIGEON HILL	335
3487	PINDAR (PINDER)	310
3505	PLASTER ROCK	305
3395	PLEASANT VILLA	319
3208	PLUMSWEEP	320
3186	POCOLOGAN	317
3348	POINT LA NIM	338
3555	POINT DU CHENE	324
3735	POINT LANDRY	334
3531	POINT SAPIN	328
3237	POINTE DE BUTE	324
3331	POINTE VERTE (GREEN POIN	336
3764	POKEMOUCHE	335
3017	POKIOK	311
3465	PONT LA FRANCE	334
3241	PORT ELGIN	324
3657	PORT ELDON	300
3239	PORTAGE HILL	324
3311	PORTAGE RIVER	333
3191	PRINCE OF WALES	322
3758	SAUMAREZ	337
3488	SCOTT	307

Loc Code	Location	Zone Code
3383	PUBLIC LANDING	319
3391	QUARRIES	319
3428	QUARRYVILLE	331
3394	QUEENSTOWN	319
3731	QUINCALKRIE	300
3166	QUISBIS BRIDGE	302
3195	QUISPAMSIS	321
3256	RANGE	318
3594	RED BANK	331
3291	REDMONDVILLE	329
3522	RENFORTH	320
3427	RENOUS	330
3033	RESTIGOUCHE	338
3283	REXTON	328
3352	RICHARDVILLE	338
3284	RICHIBUCTO	328
3605	RILEY BROOK	304
3491	RILY ROAD	300
3782	RIORDON	335
3625	RIPPLES	314
3137	RITCHIE	311
3305	RIVER DE CACHE	333
3214	RIVER GLADE	325
3721	RIVER DU CHUTE	306
3741	RIVER VERTE	302
3205	RIVERBANK	321
3513	RIVERSIDE	323
3501	RIVERVIEW	323
3539	ROBERTSON POINT	322
3761	ROBERTVILLE	336
3471	ROBICHAUD	324
3360	ROBINSONVILLE	339
3218	ROCKAWAY	325
3553	ROGERSVILLE	329
3620	ROLLING DAM	316
3194	ROTHESAY	321
3755	RUSAGORNISH	314
3231	SACKVILLE	324
3106	SAGWA	319
3174	SAINT ANDREWS	316
3004	SAINT JOHN	322
3170	SAINT STEPHEN	316
3997	SAINT JOHN YSJ	322
3100	SAINT JOHN CENTRE	322
3101	SAINT JOHN WEST-LANCAST	322
3215	SALISBURY	325
3253	SALMON RIVER	318
3812	SALMON CREEK	318
3165	ST. ANNE, MADAWASKA CO	302
3722	ST. ANTOINE	326
3529	SCOUDOUC	324
3638	SEAL COVE	317
3673	SELWOOD CORNER (SELWO	338
3561	SHANNONVILLE	321
3268	SHEDIAC	324
3269	SHEDIAC BRIDGE	324
3622	SHEFFIELD	314
3313	SHEILA	334
3603	SHEMOGUE	324
3560	SHIPPEGAN	325
3136	SHOGOMOC	311
3164	SIEGAS	302
3785	SILLIKERS	331
3595	SILVERWOOD	312
3775	SIMMON ROAD	300
3576	SKIFF LAKE	311
3458	SOMERVILLE	307
3102	SOUTH BAY	322
3483	SOUTH DEVON	312
3413	SOUTH PORTAGE	308
3616	SOUTH NELSON	329
3773	SOUTH ROAD	330
3772	SOUTH ROAD SETT (DOAKT	330
3542	SOUTHAMPTON	310
3809	SOUTHFIELD ROAD	320
3181	SPINNEY'S CORNER	317
3611	SPRINGFIELD	321
3123	SPRINGHILL	312
3192	SPRUCE LAKE	322
3359	SQUAW CAP	338
3526	ST ANTHONY'S (SAINT-ANT	326
3221	ST. ANSELME	325
3168	ST. BASIL	301
3439	ST. CHARLES	328
3275	ST. FRANCIS	326
3180	ST. GEORGE	317
3443	ST. IGNACE	328
3227	ST. JOSEPH	324
3162	ST. LEONARD	302
3287	ST. LOUIS	328
3290	ST. MARGARET	329
3440	ST. MARIE DE KENT	326
3008	ST. MARTINS	322
3277	ST. PIERRE	326
3467	ST. PONS	334
3373	ST. QUENTIN	340
3800	ST. ANDRE DE MADAWASKA	302
3279	ST. ANNE, KENT COUNTY	326
3312	TRACADIE BEACH	334
3446	TRACY	315

Loc Code	Location	Zone Code
3652	ST. ARTHUR	338
3565	ST. CROIX	311
3726	ST. FRANCOIS DE MADAWAS	301
3590	ST. JACQUES	301
3784	ST. LEOLIN	335
3474	ST. LOUIS DE KENT	328
3557	ST. MARYS	312
3554	ST. PAUL	326
3783	ST. RAPHAEL	335
3780	ST. SAUVIER	334
3781	ST. SIMON	335
3503	STANLEY	308
3261	STARKEY'S CORNER	321
3756	STE. MARIE	326
3778	STE. ROSE	335
3746	STEDIAC	300
3702	STEELARTON	300
3460	STEEVES MOUNTAIN	325
3807	STEWARTON	321
3146	STICKNEY	306
3670	STONEHAVEN	335
3641	SUGAR LOAF PARK	338
3803	SUNNY BANK	300
3751	SUNNY CORNER	331
3014	SUSSEX	320
3402	SWAN CREEK	319
3318	TABUSINTAC, GLCSTR CO.	334
3308	TABUSINTAC, NORTH. CO	333
3325	TATAMAGOUCHE	336
3411	TAYMOUTH	312
3705	TEMISCOUATA	300
3607	TEMPERANCE VALE	310
3138	TEMPLE	311
3709	TENNIYN	300
3461	THE GLADES	325
3301	THE WILLOWS	333
3370	THIBAULT	340
3747	THOMASVILLE	300
3659	THOMPSON'S CORNER	300
3355	TIDE HEAD	338
3584	TILLEY	305
3242	TIMBER RIVER	324
3704	TINKER	305
3809	TITUSVILLE	320
3584	TOBIQUE	305
3248	TORMENTINE WHARF	324
3515	TORRYBURN	322
3314	TRACADIE	334
3729	TRINITY BAY	300
3777	TROUT STREAM	334
3333	TURGEON	336
3113	TWEEDMUIR	315
3809	UPHAN (UPHAM)	320
3177	UPPER BOCABEC	316
3405	UPPER BURTON	315
3449	UPPER CAPE	324
3228	UPPER DORCHESTER	324
3401	UPPER GAGETOWN	319
3151	UPPER KENT	306
3799	UPPER ABOUVAGNE	324
3423	UPPER BLACKVILLE BRIDGE	330
3424	UPPER BLACKVILLE STATIO	330
3601	UPSALQUITCH	339
3593	VAL D'AMOUR	338
3496	VALLEY	307
3378	VENEER SIDING	340
3030	VICTORIA	307
3143	VICTORIA CORNER	307
3280	VILLE LAPRAIRIE	328
3377	VIOLETTE BROOK	340
3480	WAASIS	315
3142	WAKEFIELD	307
3661	WALLACE	317
3703	WALSH	335
3750	WALTON	321
3273	WARD'S CORNER	326
3606	WATERBOROUGH	318
3600	WATERVILLE	307
3422	WEAVERS	330
3109	WELSFORD	319
3104	WESTFIELD	319
3011	WESTMORLAND EAST	325
3549	WHITE COVE	321
3639	WHITE HEAD	317
3368	WHITES BROOK	339
3459	WICKHAM	321
3624	WICKLOW	306
3121	WILSEY ROAD	312
3666	WILSON'S BEACH	317
3309	WISHART POINT	333
3663	WOODLAND	317
3381	WOODMAN'S POINT	319
3141	WOODSTOCK	307
3635	WOODWARDS COVE	317
3571	YOHO LAKE	312
3569	YORK MILLS	313
3258	YOUNG'S COVE CORNER	318
3259	YOUNG'S COVE STATION	318

Loc Code	Location	Zone Code
3700	ZEALAND	310
3711	ZELAMB	300

APPENDIX B
NUMERICAL CODE LISTING

Loc Code	Location	Zone Code
0	NEWFOUNDLAND	0
1000	PRINCE EDWARD ISLAND	1000
2000	NOVA SCOTIA	2000
3000	NEW BRUNSWICK	300
3001	FUNDY ISLANDS	317
3002	CHARLOTTE	316
3003	OROMOCTO LAKE	313
3004	SAINT JOHN	322
3005	BROAD ROAD	322
3006	LOWER RIVER	315
3007	HAMPTON	321
3008	ST. MARTINS	322
3009	FUNDY PARK	323
3010	ALBERT EAST	323
3011	WESTMORLAND EAST	325
3012	FOREST HILL	325
3012	MONCTON	325
3013	PETITCODIAC	325
3014	SUSSEX	320
3015	GRAND LAKE	318
3016	FREDERICTON	312
3017	POKIOK	311
3018	CARLETON WEST	306
3019	CARLETON EAST	306
3020	CENTRE	330
3021	CHIPMAN	318
3022	BUCTOUCHE	326
3023	KOUCHIBOUGUAC	328
3024	CHATHAM NEWCASTLE	333
3025	CARAQUET ISLANDS	335
3026	MIRAMICHI ROAD	329
3027	BATHURST BELLEDUNE	336
3028	CAMPBELLTON DALHOUSIE	338
3029	MOUNT CARLETON PARK	339
3030	VICTORIA	307
3031	MADAWASKA WEST	302
3032	MADAWASKA EAST	301
3033	RESTIGOUCHE	338
3100	SAINT JOHN CENTRE	322
3101	SAINT JOHN WEST-LANCAST	322
3102	SOUTH BAY	322
3103	GRAND BAY	319
3104	WESTFIELD	319
3105	LINGLEY	319
3106	SAGWA	319
3107	NEREPIS	319
3108	BAYARD STATION	319
3109	WELSFORD	319
3110	FOWLERS CORNER	319
3111	CAMP PETERSON	319
3114	GEARY FORKS	315
3115	HANEYTOWN	315
3116	OROMOCTO	315
3117	LOWER LINCLON	315
3118	NEVERS ROAD	315
3119	GOODINE	315
3120	LINCOLN CROSSING	315
3121	WILSEY ROAD	312
3123	SPRINGHILL	312
3124	ISLAND VIEW	312
3125	MCGINLEYS	312
3126	FRENCH VILLAGE	312
3127	KINGSCLEAR	312
3128	LONGS CREEK, YORK CO.	312
3129	BURDEN	313
3130	PRINCE WILLIAM	313
3131	DUMFRIES	311
3132	BARONY	311
3133	HAWKSHAW	311
3134	NAPERVILLE	311
3135	ALLANDALE	311
3136	SHOGOMOC	311
3137	RITCHIE	311
3138	TEMPLE	311
3139	MEDUCTIC	311
3140	BULL'S CREEK	307
3141	WOODSTOCK	307
3142	WAKEFIELD	307
3143	VICTORIA CORNER	307
3144	HARTLAND	307
3145	PEEL	306
3146	STICKNEY	306
3147	EAST FLORENCEVILLE	306
3148	BRISTOL	306
3149	BATH	306
3150	BEECHWOOD	306
3151	UPPER KENT	306
3152	MUNIAC	305
3153	KILBURN	305
3154	PERTH	305
3155	ANDOVER	305
3156	AROOSTOCK JUNCTION	303
3157	FOUR FALLS	303
3158	LONG SWAMP	303
3159	LIMESTONE SIDING	303
3160	GRAND FALLS	303
3161	BELLEFLEUR	302
3162	ST. LEONARD	302
3164	SIEGAS	302
3165	ST. ANNE, MADAWASKA CO	302

Loc Code	Location	Zone Code
3111	PETERSVILLE	319
3112	LEWISVILLE, QUEENS CO.	319
3113	TWEEDMUIR	315
3166	QUISBIS BRIDGE	302
3167	GREEN RIVER	302
3168	ST. BASIL	301
3169	EDUMUNDSTON	301
3170	SAINT STEPHEN	316
3171	OAK BAY	316
3172	GILLMAN'S CORNER	316
3173	BAYSIDE	316
3174	SAINT ANDREWS	316
3175	CHAMCOOK	316
3176	LOWER BOCABEC	316
3177	UPPER BOCABEC	316
3178	DIGDEGUASH	316
3179	BETHEL	317
3180	ST. GEORGE	317
3181	SPINNEY'S CORNER	317
3182	PENNFIELD CORNER	317
3183	BLACK'S HARBOUR	317
3184	PENNFIELD AIRPORT	317
3185	CROW HARBOUR	317
3186	POCOLOGAN	317
3187	NEW RIVER	317
3188	LEPREAU	317
3189	HALL'S LAKE SIDING	322
3190	MUSQUASH	322
3191	PRINCE OF WALES	322
3192	SPRUCE LAKE	322
3194	ROTHESAY	321
3195	QUISPAMSIS	321
3196	MODEL FARM	321
3197	HAMMOND RIVER	321
3198	NAUWIGEWAUK	321
3199	LAKESIDE	321
3200	HAMPTON STATION	321
3201	HAMPTION VILLAGE	321
3202	LOWER NORTON	321
3203	PASSEKEAG	321
3203	BLOOMFIELD	321
3204	NORTON	321
3204	DICKIE MOUNTAIN	321
3205	RIVERBANK	321
3206	APOHAQUI	320
3206	ERB SETTLEMENT	320
3208	PLUMSWEEP	320
3209	PENOBSQUIS	320
3210	MECHANIC SETTLMNT RD	320
3211	FIVE POINTS	320
3216	BOUNDRY CREEK	325
3217	JONES	325
3218	ROCKAWAY	325
3220	DIEPPE	325
3221	ST. ANSELME	325
3222	FOX CREEK	325
3223	DOVER ROAD	325
3224	MEMRAMCOOK WEST	324
3225	MEMRAMCOOK	324
3226	COLLEGE BRIDGE	324
3227	ST. JOSEPH	324
3228	UPPER DORCHESTER	324
3229	DORCHESTER	324
3230	FROSTY HOLLOW	324
3231	SACKVILLE	324
3232	COLES ISLAND, WEST. CO	324
3233	AULAC	324
3237	POINTE DE BUTE	324
3238	JOLICURE ROAD	324
3239	PORTAGE HILL	324
3240	BAIE VERTE	324
3241	PORT ELGIN	324
3242	TIMBER RIVER	324
3243	HARDYS	324
3244	MELROSE	324
3245	MALDEN	324
3246	BAYFIELD	324
3247	CAPE TORMENTINE	324
3248	TORMENTINE WHARF	324
3249	MINTO	314
3250	NEWCASTLE BRIDGE	318
3251	HARDWOOD RIDGE	314
3252	HUMPHREY'S CORNER	318
3253	SALMON RIVER	318
3255	COAL CREEK	318
3256	RANGE	318
3257	CUMBERLAND BAY	318
3258	BAGDHAD	318
3258	YOUNG'S COVE CORNER	318
3259	YOUNG'S COVE STATION	318
3260	COLE'S ISLAND, QUEENS CO.	321
3261	STARKEY'S CORNER	321
3262	LONG CREEK, QUEENS CO.	321
3263	KIERSTEAD MOUNTAIN	320
3264	BERWICK	320
3264	LOWER MILLSTREAM	320
3265	COOK'S BROOK	325
3266	BATEMAN'S	325
3267	GILBERT'S CORNER	325
3268	SHEDIAC	324

Loc Code	Location	Zone Code
3212	ANAGANCE	320
3214	RIVER GLADE	325
3215	SALISBURY	325
3269	SHEDIAC BRIDGE	324
3270	COCAGNE	326
3271	BREAU VILLAGE	326
3272	DEPRES ROAD	326
3273	WARD'S CORNER	326
3274	LITTLE RIVER	326
3275	ST. FRANCIS	326
3277	ST. PIERRE	326
3278	IRVINGDALE ROAD	326
3279	ST. ANNE, KENT COUNTY	326
3280	VILLE LAPRAIRIE	328
3281	EAST GALLOWAY	328
3282	GALLOWAY HILL	328
3283	REXTON	328
3284	RICHIBUCTO	328
3285	LITTLE ALDOUANE	328
3286	BIG ALDOUANE	328
3287	ST. LOUIS	328
3289	LAKETON	328
3290	ST. MARGARET	329
3291	REDMONDVILLE	329
3292	BLACK RIVER	329
3293	NAPPAN	329
3294	CHATHAM	333
3295	NEWCASTLE	333
3296	DOUGLASTOWN	333
3297	FERRY ROAD	333
3298	MILLBANK	333
3299	LOWER NEWCASTLE	333
3300	BARTIBOG	333
3301	THE WILLOWS	333
3302	BARRYVILLE	333
3303	NEW JERSEY	333
3304	BURNT CHURCH	333
3305	RIVER DE CACHE	333
3306	NEGUAC	333
3307	COVEDELL	333
3308	TABUSINTAC, NORTH. CO	333
3309	WISHART POINT	333
3310	BRANTVILLE	333
3311	PORTAGE RIVER	333
3312	TRACADIE BEACH	334
3313	SHEILA	334
3314	TRACADIE	334
3315	LITTLE BARTIBOG	333
3316	BARTIBOG RIVER	333
3317	ESKEDELLOC STREAM	334

Loc Code	Location	Zone Code
3321	ALLARDVILLE NORTH	334
3322	BASS RIVER	336
3323	EAST BATHURST	336
3324	BATHURST	336
3325	TATAMAGOUCHE	336
3326	PETERS RIVER	336
3327	BERESFORD	336
3328	NIGADOO	336
3329	PETIT ROCHER	336
3330	ELM TREE	336
3331	GREEN POINT (POINTE VERT	336
3331	POINTE VERTE (GREEN POIN	336
3332	BELLEDUNE	336
3333	TURGEON	336
3334	HODGSON	336
3335	BELLEDUNE RIVER	336
3336	CULLIGAN	337
3337	JAQUET RIVER	337
3338	NASK CREEK	337
3339	BLACK POINT	337
3340	DICKLES	337
3341	BENJAMIN RIVER	337
3342	NEW MILLS	337
3342	NEW MILLS	337
3343	BLACK LANDS	337
3344	CHARLO	337
3345	CREIGS	337
3346	EEL RIVER BAR	337
3347	DALHOUSIE	337
3348	POINT LA NIM	338
3349	DALHOUSIE JUNCTION	338
3350	MAPLE GREEN	338
3351	MCLEOD'S	338
3352	RICHARDVILLE	338
3353	CAMPBELLTON	338
3354	ATHOLVILLE	338
3355	TIDE HEAD	338
3356	CHRISTOPHER	338
3357	GLENLEVIT	338
3358	DAWSONVILLE	338
3359	SQUAW CAP	338
3360	ROBINSONVILLE	339
3361	GLENWOOD, RESTIGOUCHE	339
3362	MILLERVILLE	339
3363	GROG BROOK SHED	339
3364	GROG BROOK DAM	339
3365	C.C. SIDING	339
3366	OLIVER SIDING	339
3367	MANN SIDING	339
3368	WHITES BROOK	339

Loc Code	Location	Zone Code
3318	TABUSINTAC, GLCSTR CO.	334
3319	DAULNAY	334
3320	ALLARDVILLE	334
3369	KEDGWICK	340
3370	THIBAULT	340
3371	LAUVRIERE	340
3372	FIVE FINGERS	340
3373	ST. QUENTIN	340
3374	HARDINE BROOK	340
3375	HAMMOND BROOK	340
3376	BLACK BROOK	340
3377	VIOLETTE BROOK	340
3378	VENEER SIDING	340
3379	CARON	340
3380	COTE	303
3381	WOODMAN'S POINT	319
3382	MORRISDALE	319
3383	PUBLIC LANDING	319
3384	GREENWICH HILL	319
3385	BROWNS FLATS	319
3386	GLENWOOD, KINGS CO.	319
3387	CENTRAL GREENWICH	319
3388	OAK POINT	319
3389	MCPHERSON	319
3390	EVANDALE	319
3391	QUARRIES	319
3392	HAMPSTEAD	319
3393	CENTRAL HAMPSTEAD	319
3394	QUEENSTOWN	319
3395	PLEASANT VILLA	319
3396	GAGETOWN ROAD	319
3397	GAGETOWN	319
3398	MILL BRIDGE	319
3399	DUCK CREEK	319
3400	GUNTERS	319
3401	UPPER GAGETOWN	319
3402	SWAN CREEK	319
3403	BABBIT	319
3404	LOWER BURTON	315
3405	UPPER BURTON	315
3406	MARYSVILLE	312
3407	PENNIAC BRIDGE	312
3408	MANNERS	312
3409	NASHWAAK VILLAGE	312
3410	DURHAM VILLAGE	312
3411	TAYMOUTH	312
3412	NASHWAAK BRIDGE	312
3413	SOUTH PORTAGE	308
3414	MCGIVNEY	308
3415	ASTLE	308

Loc Code	Location	Zone Code
3419	CARROLL'S ROAD	330
3420	DOAKTOWN	330
3421	BLISSFIELD	330
3422	WEAVERS	330
3423	UPPER BLACKVILLE BRIDGE	330
3424	UPPER BLACKVILLE STATIO	330
3425	BLACKVILLE	330
3426	BARNETT'S	330
3427	RENOUS	330
3428	QUARRYVILLE	331
3429	DAVIDSON'S	331
3430	BRYENTON STATION	331
3431	MILLERTON	331
3432	AMOS	331
3433	CURTIS CORNER	331
3434	CAMBRIDGE	321
3435	FREDERICTON JUNCTION	315
3436	BURTTS CORNER	309
3437	LOWER ST. MARY'S	312
3438	LOGGIEVILLE	333
3439	ST. CHARLES	328
3440	ST. MARIE DE KENT	326
3441	ACADIEVILLE	328
3442	CANAAN	320
3443	ST. IGNACE	328
3444	ESCUMINAC	329
3445	NAPADOGAN	309
3446	TRACY	315
3448	GRAND MANAAN	317
3449	UPPER CAPE	324
3450	FOSTERVILLE	311
3451	BIG COVE	326
3452	BEERSVILLE	326
3453	BROOKVALE	318
3454	LAVILLETTE	333
3455	CLIFTON	335
3458	SOMERVILLE	307
3459	WICKHAM	321
3460	BERRY MILLS	325
3460	STEEVES MOUNTAIN	325
3461	THE GLADES	325
3462	FAWCETT HILL	325
3463	COLDBROOK	322
3464	HILDEGARDE	325
3465	PONT LA FRANCE	334
3466	MAPLETON (MAPLE WOOD)	310
3467	ST. PONS	334
3468	BRIDGE DALE	323
3469	HIGHVIEW	300
3470	DUPUIS CORNER	324

Loc Code	Location	Zone Code
3416	BOIESTOWN	330
3417	LUDLOW	330
3418	MCNAMEE ROAD	330
3471	ROBICHAUD	324
3472	IRISHTOWN	325
3473	MISCOU	335
3474	ST. LOUIS DE KENT	328
3475	KOUCHIBOUGUAC NTL PAR	328
3476	EAST HAMPTON	321
3478	BURTON	315
3479	CURRIE	305
3480	WAASIS	315
3481	NEWBURG	307
3482	GREEN ROAD	307
3483	SOUTH DEVON	312
3484	LICFORD	305
3485	BEVERIDGE	305
3486	ARGOSY	303
3487	PINDAR (PINDER)	310
3488	SCOTT	307
3489	MARTIN	302
3490	MARTIN SIDING	302
3491	RILY ROAD	300
3492	IRON BEN COVE	318
3493	CYR JUNCTION	302
3494	BRENTON	307
3495	DEEP CREEK	307
3496	VALLEY	307
3497	ORTONVILLE	303
3498	HALE	307
3499	ADAM	339
3500	KESWICK	310
3501	RIVERVIEW	323
3502	ALMA	323
3503	STANLEY	308
3504	PIGEON HILL	335
3505	PLASTER ROCK	305
3506	NASHWAAKSIS	312
3507	CENTERVILLE	306
3508	LOCH LOMAND	322
3509	MAGNETIC HILL	325
3509	LUTES MOUNTAIN	325
3510	GLEN FALLS	322
3511	KENNEBECASIS PARK	321
3512	CARAQUET	335
3513	RIVERSIDE	323
3514	HATFIELD	321
3515	TORRYBURN	322
3516	KINGSTON	321
3517	HARDINGS POINT	322
3521	DEER ISLAND	317
3522	RENFORTH	320
3523	BACK BAY	317
3524	CAPE BALD (CAP PELE)	324
3524	CAP PELE (CAPE BALD)	324
3525	ANTHONY'S COVE	322
3526	ST ANTHONY'S (SAINT-ANT	326
3527	LAKEBURN	325
3528	ELGIN	323
3529	SCOUDOUC	324
3530	GUNNINGSVILLE	325
3531	POINT SAPIN	328
3532	HILLSBOROUGH	323
3533	HARCOURT	327
3534	HOPEWELL CAPE	323
3535	DOUGLAS	309
3536	MAUGERVILLE	314
3537	HOWARD	330
3538	ARTHURETTE	305
3539	ROBERTSON POINT	322
3540	INGLESIDE	319
3541	LAKEVILLE CORNER	314
3542	SOUTHAMPTON	310
3543	NACKAWIC	310
3544	JEMSEG	319
3545	HARVEY	313
3546	MILLVILLE	310
3547	MACADAM	311
3548	MOORES MILLS	316
3549	WHITE COVE	321
3550	CAMPOBELLO	317
3551	CODYS	321
3553	ROGERSVILLE	329
3554	ST. PAUL	326
3555	POINT DU CHENE	324
3556	BAIE ST. ANNE	324
3557	ST. MARYS	312
3558	COVERDALE	325
3559	HOPEWELL HILL	323
3560	SHIPPEGAN	325
3561	SHANNONVILLE	321
3562	MILLTOWN	316
3563	LAGACEVILLE	333
3564	OAK HILL	316
3565	ST. CROIX	311
3566	EVANGELINE	324
3567	NEW DENMARK	303
3568	FOREST CITY	311
3569	YORK MILLS	313
3570	CANTERBURY	311

Loc Code	Location	Zone Code
3518	GONDOLA POINT	321
3519	FAIRVALE	320
3520	LEWISVILLE, WESTMLND CO.	325
3571	YOHO LAKE	312
3572	BAY DU VIN	329
3573	HAVELOCK	320
3574	ALBERT	323
3575	FLORENCEVILLE	306
3576	SKIFF LAKE	311
3577	LAKE GEORGE	313
3578	PRINCESS PARK	318
3579	MAGUNDY	313
3580	DAVIDSON LAKE	312
3581	MACTAQUAC	312
3582	DEBEC	307
3583	MALISEET	305
3584	TILLEY	305
3584	TOBIQUE	305
3585	BAKER LAKE	301
3586	JUNIPER	306
3587	CALF SETTLEMENT	300
3588	DRUMMOND	303
3589	LAKE UTOPIA	317
3590	ST. JACQUES	301
3591	CLAIR	301
3592	FLATLANDS	338
3593	VAL D'AMOUR	338
3594	RED BANK	331
3595	SILVERWOOD	312
3596	NELSON	329
3598	BARKERS POINT	312
3599	HOYT	315
3600	WATERVILLE	307
3601	UPSALQUITCH	339
3602	GLENCOE	338
3603	SHEMOGUE	324
3604	NOTRE DAME	326
3605	RILEY BROOK	304
3606	WATERBOROUGH	318
3606	MILL COVE	318
3607	TEMPERANCE VALE	310
3608	BARACHOIS	324
3609	BEAVER HARBOUR	317
3610	BLACK BAY	322
3611	SPRINGFIELD	321
3611	BELLEISLE	321
3611	BELLEISLE CREEK	321
3612	COLLETTE	329
3613	GRAND-DIGUE	326
3614	BLISSVILLE	315
3618	CHANCE HARBOUR	322
3619	DIPPER HARBOUR	322
3620	ROLLING DAM	316
3621	HANWELL	312
3622	SHEFFIELD	314
3623	DERBY	331
3624	WICKLOW	306
3625	RIPPLES	314
3632	INGALLS HEAD	317
3633	NORTH HEAD	317
3634	GRAND HARBOUR	317
3635	WOODWARDS COVE	317
3637	CEDAR COVE	317
3638	SEAL COVE	317
3639	WHITE HEAD	317
3640	EEL RIVER CROSSING	337
3641	SUGAR LOAF PARK	338
3644	CHARACTERSVILLE	325
3645	GAFTON	307
3646	PETERS HILL	300
3647	BROWNVILLE	321
3648	COLESON COVE	322
3652	ST. ARTHUR	338
3656	BEDDECK	300
3657	PORT ELDON	300
3658	MACDONALD'S POINT	321
3659	THOMPSON'S CORNER	300
3660	COLDSTREAM	307
3661	WALLACE	317
3663	WOODLAND	317
3664	ELMSVILLE	316
3665	BONNY RIVER	317
3666	WILSON'S BEACH	317
3667	BARTLETT MILLS	316
3668	MALPECK	300
3669	LOWER HAINSVILLE	310
3670	STONEHAVEN	335
3672	NEW MARYLAND	313
3673	SELWOOD CORNER (SELWO	338
3674	DARLINGTON	337
3700	ZEALAND	310
3701	LISFORD	300
3702	STEELARTON	300
3703	WALSH	335
3704	TINKER	305
3705	TEMISCOUATA	300
3706	CLARENOON	319
3707	HEWITT	316
3708	MELLVILLE	300
3709	TENNIYN	300

Loc Code	Location	Zone Code
3615	KENT JUNCTION	327
3616	SOUTH NELSON	329
3617	NARROWS	321
3710	MORRILL	303
3711	ZELAMB	300
3713	ACAMAC	322
3714	LONDONBERRY	320
3715	HILLTOWN	300
3716	LAMEQUE	335
3717	CROSS CREEK	308
3718	MULGRAVE	300
3719	HEATHSTEEL	332
3720	GRANDANSE	335
3721	RIVER DU CHUTE	306
3722	ST. ANTOINE	326
3723	ADAMSVILLE	327
3724	GOSHEN	323
3725	KETEPEC	300
3726	ST. FRANCOIS DE MADAWAS	301
3729	TRINITY BAY	300
3730	MILLSBORO	300
3731	QUINCALKRIE	300
3732	GRANDSAULT	303
3733	BURNSVILLE	335
3734	BERTRAND	335
3735	POINT LANDRY	334
3736	CALHOWN	325
3737	PAQUETTEVILLE	335
3741	RIVER VERTE	302
3743	GLADES	325
3744	FAIRFIELD	322
3745	BARNESVILLE	319
3746	STEDIAC	300
3747	THOMASVILLE	300
3748	ANTERVILLE	300
3749	BARBOUR PASSAGE	300
3750	WALTON	321
3751	SUNNY CORNER	331
3754	CORK STATION	313
3755	RUSAGORNISH	314
3756	STE. MARIE	326
3757	HOLMESVILLE	306
3758	SAUMAREZ	337
3759	FOUR ROADS	335
3760	KINGS LANDING	313
3761	ROBERTVILLE	336
3762	NEGUSE	300
3763	DUNDEE	338
3764	POKEMOUCHE	335
3765	MIRAMICHI	329

Loc Code	Location	Zone Code
3769	MILLIDGEVILLE	322
3770	MURRAY CORNER	324
3771	NORTH RIVER	325
3772	SOUTH ROAD SETT (DOAKT	330
3773	SOUTH ROAD	330
3774	D. CROSSING	300
3775	SIMMON ROAD	300
3776	HOPPER SETTLEMENT	323
3777	TROUT STREAM	334
3778	STE. ROSE	335
3779	MAISONETTE	335
3780	ST. SAUVIER	334
3781	ST. SIMON	335
3782	RIORDON	335
3783	ST. RAPHAEL	335
3784	ST. LEOLIN	335
3785	SILLIKERS	331
3786	BUSHVILLE	333
3789	LORNE	337
3790	CURTIS PARK	333
3791	MARTINON	322
3792	COBURN	313
3794	CASTALIA	317
3795	GORDONSVILLE	317
3796	DUGANVILLE	300
3797	CHALEUR PARK (DALHOUSI	337
3798	CAISSE CAPE	326
3799	UPPER ABOUVAGNE	324
3800	ST. ANDRE DE MADAWASKA	302
3801	BLANCHARD SETTLEMENT	335
3802	COTEAU ROAD	335
3803	SUNNY BANK	300
3804	JANEVILLE	335
3805	BROWN RIDGE	315
3806	LITTLE LAKE CORNER	315
3807	STEWARTON	321
3808	MARRTOWN	320
3809	TITUSVILLE	320
3809	SOUTHFIELD ROAD	320
3809	UPHAN (UPHAM)	320
3810	FLUME RIDGE	316
3811	NEW IRELAND	323
3812	SALMON CREEK	318
3813	MILLBROOK	321
3814	LITTLE CAPE	324
3816	DEERSDALE	309
3996	CHARLO	337
3997	SAINT JOHN YSJ	322
3998	FREDERICTON YFC	312
3999	MONCTON YQM	325

Loc Code	Location	Zone Code
3766	GLOUCESTER	336
3767	BALMORAL	338
3768	KINGS CO.	320

Loc Code	Location	Zone Code
4000	OTHER CANADA	4000
5000	USA	5000

APPENDIX C

DATA EDITING LOGIC CHECKS

FGA

Range specifications for variable IDNO:

6014 thru 18205

Range specifications for variable INTVWR:

1 thru 21

Range specifications for variable STNNO:

1 thru 7

Range specifications for variable TDIR:

1 thru 4

Range specifications for variable DATE:

0703,0709,0710,0711,0716,0717,0718

Range specifications for variable YEAR:

91

Range specifications for variable HOUR:

0 thru 23

Range specifications for variable VTYPE:

1 thru 12

Range specifications for variable NO_AXLES:

2 thru 10

Range specifications for variable NO_OCC:

1 thru 9

Range specifications for variable ORIGIN:

00000,1000,2000,3000 thru 4000,5000,99999

Range specifications for variable DEST:

00000,1000,2000,3000 thru 4000,5000,99999

Range specifications for variable PRINTP:

1 thru 11,..

Range specifications for variable EVINTP:

1 thru 11,..

Range specifications for variable OVTRPURP:

1 thru 8,11,.

Range specifications for variable ROUTE:

1 thru 3,.

Range specifications for variable MCNT:

1 thru 4

Rule ODSAME:

origin ne dest

Rule NO_AXLES:

vtype=1 or vtype=3 implies no_axles=2

Rule NO_AXLEI:

no_axles=2 implies vtype=1 or vtype=3 or vtype=5 or vtype=4

Rule BUSTYPE:

vtype=4 implies no_axles le 3 and (no_occ=9 or no_occ=1)

Rule PURP1:

vtype=4*10 implies ovtrpurp=1 or ovtrpurp=2 or ovtrpurp=8

Rule BUSTYP2:

vtype=4 and no_occ>1 implies ovtrpurp=8

Rule MCYC1:

vtype=3 implies no_occ<3

Rule INSTP1:

prints ne . implies printp ne .

Rule INSTP2:

evints ne . implies evintp ne .

Rule INSTP3:

printp ne . implies prints ne .

Rule INSTP4:

evintp ne . implies evints ne .

Rule HOUR1:

stnno=1 or stnno=2 or stnno=3 or stnno=4 or stnno=5
implies hour le 18 and hour ge 7

Rule TDIR1:

stnno=3 implies tdir=3 or tdir=4

Rule TDIR2:

stnno=1 or stnno=2 or stnno=4 or stnno=5 or

stnno=7 implies tdir=1 or tdir=2

Rule STNN2:

(stnno eq 2 or stnno eq 5) and (mcnt >1)
implies route ne .

Rule ORDES2:

origin ne . implies dest ne .

Rule ORDES3:

dest ne . implies origin ne .

Rule ORDES4:

origin ne . or dest ne . implies ovtrpurp ne .

Rule OVTRP2:

ovtrpurp ne . implies origin ne . and dest ne .

Rule STNN4:

mcnt=1 implies route eq .

Rule STNN5:

(route = .) and (stnno=2 or stnno = 5) implies mcnt=1

Rule TDIR3:

stnno = 6 implies tdir = 1 or tdir = 2 or tdir =4

Rule STNN6:

route ne 3

Rule STNN7:

stnno=4 implies route eq . or route eq 1

Rule STNN8:

stnno=3 implies route eq . or route eq 1

Rule STNN9:

stnno=2 and vtype = 5*10 and mcnt>1 implies route eq 1

Rule STNN10:

stnno=6 and vtype = 5*10 and mcnt>2 implies route eq 1

Rule STNN11:

stnno=3 and route eq 1 implies mcnt ge 3

kule STNN12:

stnno=7 implies route eq 1 or route eq .

Rule VTYPE1:

stnno=6 and stnno = 7 implies vtype = 5*10

Rule VTYPE2:

vtype=5*10 implies stnno ne 1 or stnno ne 6

Rule STNN2A:

stnno=1 and mcnt>2 implies route ne .

Rule STNN5A:

route = . and stnno=1 implies mcnt le 2

APPENDIX D

SAMPLE CALCULATIONS FOR EXPANSION FACTORS

FGA

The calculations below illustrate the steps which were completed to develop the expansion factors. The example shows the expansion of single unit trucks in the southbound direction during the November survey period at Geary.

1. Expansion of the Survey Station Interview Data to Represent the Survey Period

$$FSP = \frac{\text{Manual Count of Single Unit Trucks for the Survey Period}}{\text{Number of Single Unit Truck Interviews for the Survey Period}}$$

$$= \frac{67}{25}$$

$$= 2.680$$

2. Expansion of the Survey Period Data to the 24-Hour Survey Day

$$FSD = \frac{\text{Number of 24-Hour Survey Day Single Unit Trucks}}{\text{Number of Survey Period Single Unit Trucks}}$$

$$= \frac{90}{67}$$

$$= 1.343$$

3. Adjustment of the Survey Day to an Average Day of the Survey Week

$$FSW = \frac{\text{Average Weekday Single Unit Truck Volume}^{*}}{\text{Survey Day Single Unit Truck Volume}}$$

$$= \frac{130}{157}$$

$$= .829$$

4. Adjustment of the Survey Week to Account For Seasonality

$$FS = \frac{\text{Average Month Factor}}{\text{Survey Month Factor At Geary}}$$

$$= \frac{1}{.96}$$

$$= 1.042$$

* Average Weekday Single Unit Truck Volume = $\frac{\text{7 Day Survey Week Volume}}{7}$